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# **Fiscal Policy in Commodity-Exporting LDCs**

John Cuddington

Commodity-exporting countries have sometimes found themselves worse off after a boom than before it, due to fiscal mismanagement of the boom proceeds. Good fiscal control during booms can temporarily accelerate the rate of economic development.

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Revenues in countries that rely heavily on one or two primary commodities tend to fluctuate widely with prices in international markets. This fluctuation is especially wide when export taxes are a large part of the total tax base but also when the private sector reaps most of the gains from booming prices.

Most developing countries have over consumed in response to windfalls from surges in world prices. In many cases government spending has outstripped the gain in revenues. These sharp increases in government spending are difficult to reverse when the boom ends and often lead to large fiscal deficits rather than surpluses.

Countries like Cameroon and Colombia, however, whose policies emphasized conservative fiscal management, have generally benefited from booms. The most effective government policies:

- Allocate public investment programs to sound projects that do not involve burdensome recurring costs.
- Keep government spending at levels consistent with long-run budget expectations.
- Maintain prudent external borrowing and foreign exchange reserve policies.

Programs along these lines have the potential to reduce a country's debt and restore economic growth.

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## I. INTRODUCTION

A large number of developing countries rely heavily on one or two primary commodity exports as an important source of national income and foreign exchange. As Table 1 shows, the share of primary commodities (including fuels, minerals, and metals) in total exports of all developing countries was 60 percent in 1985. Although this ratio has fallen gradually from 80 percent in 1965 to its present level, primary commodity exports continue to loom large in the export activity of low-income and middle-income LDCs.

In virtually all of these countries, commodity market developments have important effects on the government budget. Not only do trade taxes generate a large fraction of total government revenue. In many countries the government has a direct ownership stake in the production of primary commodities, especially in the cases of fuels, metals and minerals. In others it benefits indirectly through its role as an international marketing agent for private producers, because it passes on less than 100 percent of the world price to producers.

The booming world commodity markets of the 1970s and the post-war lows for real commodity prices in the mid-1980s have created complex economic management problems for commodity exporters.<sup>1/</sup> The experiences of commodity-exporting LDCs during the 1970s have made it abundantly clear that

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<sup>1/</sup> In July 1987, the IMF's index of 39 primary commodity prices hit its lowest level in the post World War II period (IMF Survey 16, 14 (July 13, 1987), p. 209). In the third quarter of 1987, some commodity prices, notably those for metals and agricultural raw materials, moved upward sharply, contributing to a general improvement in the index before the October 1987 stock market collapse impacted the commodity markets.

**TABLE 1**  
**STRUCTURES OF MERCHANDISE EXPORTS**  
 (percentages of total merchandise exports)

	Fuels, minerals and metals		Other primary commodities		Total primary commodities	
	1965	1985	1965	1985	1965	1985
Low-income economies		25		31		56
China and India		25		22		47
Other	24	23	67	53	91	76
Middle-income	34	40	46	19	80	59
Lower middle-income	28	51	63	29	91	80
Upper middle-income	37	37	38	16	75	53
Developing countries	32	39	48	21	80	60
Oil exporters	66	84	29	7	95	91
Exporters of manufactures	9	13	40	17	49	30
Highly indebted countries	38	46	51	26	89	72
Sub-Sahara Africa	32	63	60	31	92	94
High Income Oil Exporters	98	98	1		99	98
Industrial Market Economies	9	11	21	13	30	24

Source: World Development Report 1987, Statistical Appendix: Table II, p. 222-223

export booms caused by surges in world prices (or natural resource discoveries), while potentially beneficial, can give rise to major internal and external imbalances. In many cases, countries have responded to booms in a manner that, when viewed with hindsight, at least, can hardly be viewed as optimal.

Coping with the commodity busts of the 1980s has been made more difficult by the legacy of earlier boom mismanagement which left many LDCs with overextended, inefficient investment programs, excessive external debt, and large structural fiscal deficits. This has made it difficult for fiscal policy to play a stabilizing role in the 1980s as per capita income growth and employment slowed and, in many cases, turned negative.

The objective of this paper is to discuss the conduct of fiscal policy in commodity-exporting countries faced with periodic surges in world prices. By capitalizing on positive developments of this sort, countries can greatly improve their growth and debt servicing prospects. Poor management of booms, on the other hand, is not only a lost opportunity; in extreme cases, the country may end up worse off after the boom subsides.

Concern about poor management of booms is based on the experience of the past 20 or 30 years. Most developing countries have tended to overconsume during periods of temporary or medium-term booms, and have often experienced liquidity crises when the booms ended. In many cases countries' foreign reserve positions have been little better, or even worse, after the boom subsided than before it began. (See Davis, 1983). Many of these countries allowed regulated price structures and particularly exchange rates to deviate substantially from free-market levels, discouraging efficient resource allocation and greatly compounding the problems of adjustment to subsequent

drops in export prices. Countries that managed favorable terms of trade shocks well were typically those that: (i) did not allow prices (e.g. exchange rates, agricultural producer prices, and wages) to get badly out of line, (ii) did not indulge in wasteful and inefficient investment, or investments that involved burdensome recurrent costs into the foreseeable future, (iii) limited increases in government spending to levels consistent with the long-run trends in revenue collection, and (iv) maintained prudent external borrowing and foreign exchange reserve policies. <sup>2/</sup>

Clearly, periodic windfall gains offer a unique potential to reduce external imbalances and restore economic growth. <sup>3/</sup> This paper highlights the lessons from past booms and busts for the conduct of fiscal and related policies.

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<sup>2/</sup> Countries whose policies during the past decade have exhibited most of these characteristics include Botswana, Cameroon, China, India, Pakistan, Korea, and Thailand.

<sup>3/</sup> These concerns take on special importance for the World Bank in countries where the Bank is supporting structural adjustment programs. Temporary increases in resources from export bonanzas may facilitate structural adjustment programs that are being postponed, allegedly because of insufficient foreign exchange. Issues of the appropriate timing of such programs from a macro stability standpoint must of course be addressed. See Cuddington (1986) for a discussion of this aspect of boom management. On the other hand, misuse of the additional foreign exchange could easily undermine structural adjustment efforts.

## II. BOOMING SECTOR ECONOMICS AND THE DUTCH DISEASE

Analytical work on the aggregate and sectoral impacts of terms of trade shocks and natural resource discoveries mushroomed as commodity markets boomed in the 1970s. Hence, economists now have a good understanding of how various types of economies respond to these shocks, and situations where some sort of public sector intervention to "manage the export boom" is potentially beneficial. Both microeconomic or allocational aspects and macroeconomic aspects must be considered because: (i) the boom initially impacts the booming sector, but is propagated to other sectors as domestic demand increases and factor markets adjust, and (ii) external shocks have a direct impact on a country's foreign exchange reserves and therefore have important monetary and financial consequences.

A positive terms of trade shock caused by a sharp upward movement in the price of a country's primary commodity exports implies a rise in real income in the current period and, depending on the duration of the boom and its repercussions on other sectors of the economy, in several subsequent periods. The allocational consequences of the boom are typically summarized by focusing on two effects: the spending effect and the resource movement effect.<sup>4/</sup> For short-lived booms the spending effect is likely to be the more important of the two. The spending effect refers to the higher level of domestic spending on both traded and nontraded goods as a result of the wealth gain implied by the improved terms of trade. The resource movement

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<sup>4/</sup> The same effects are relevant in the case where the boom results from the discovery of a natural resource, such as the Dutch or British discoveries of North Sea oil, rather than a favorable terms of trade shock.



effect is relevant in situations where the booming sector is not an isolated "enclave," so that higher prices and profits in the booming sector induce producers to hire productive resources from the "lagging" tradeables sector or the nontradeables sector, or from the pool of unemployed (if the economy is operating at less than full capacity prior to the boom).

In the most straightforward case where full employment prevails, the spending effect has several important consequences. First, an increased demand for imports occurs, as domestic demand for tradeable goods rises. Here "tradeable goods" refers to goods that are not sheltered by quotas; i.e. they are freely available at prevailing world prices plus any domestic tariff levy. <sup>5/</sup> <sup>6/</sup>

Second, the real exchange rate appreciates. Unlike imports (in small economies, at least), the supply of nontradeables is not perfectly elastic at the pre-boom price. Hence, the spending effect, to the extent that it is directed towards nontradeables, causes their relative price in terms of tradeables to rise. That is, the real exchange rate appreciates. This causes nontradeables producers to bid up wages, enticing labor to reallocate from the tradeables sector to nontradeables. Thus the real product wage in terms of tradeables rises, but the real product wage in nontradeables falls (as the marginal productivity of labor declines).

Third, in the presence of real wage stickiness, the sectoral reallocation of labor may be accompanied by a transitional increase in

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<sup>5/</sup> Although the theoretical literature has not emphasized this aspect, both the surge in exports and the induced increase in import demand will lead to an increase in government revenue from trade taxes. In practice, these budgetary consequences of the boom are extremely important.

<sup>6/</sup> Tradeable goods sheltered by quotas in effect become nontradeables in terms of how their prices respond to the boom.

unemployment. This situation arises when nominal wages are linked to a price index that places a heavy weight on the price of output in the booming sector and/or prices of nontradeables, which are bid up by the spending effect of the boom. These price increases are reflected quickly in higher nominal wages in the presence of real wage stickiness due to indexing. The higher nominal wages imply higher real product wages in the lagging sector, and hence a fall in sectoral employment. Depending on the magnitude of this drop in lagging sector employment relative to the increase in employment in the booming sector (and perhaps the nontradeables sector), it is possible that total employment falls during an export boom. <sup>7/</sup>

Fourth, "de-industrialization" occurs. The reduction in employment and output of the lagging tradeables sector caused by real exchange rate appreciation is often referred to as de-industrialization or de-agriculturalization, depending on the lagging sector involved. Although this reallocation of resources away from the non-booming tradeables sector is an economic mechanism that helps to restore market equilibrium, it is often considered undesirable from a social standpoint, particularly if it occurs on a large scale and the boom is expected to be short-lived rather than "permanent." For example, the temporary loss in production may entail a socially costly loss of development momentum in cases from the lagging sector provides positive externalities (such as those arising from learning by doing, which depends on cumulative production experience). In the presence of capital market imperfection and other plausible assumptions, the optimal subsidy to production in the lagging sector should be increased during

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<sup>7/</sup> See Neary and van Wijnbergen (1985) for a more detailed discussion of the implications of real wage rigidity.

temporary booms to prevent an excessive contraction of that sector.<sup>8/</sup> In other cases the presence of nominal wage and price stickiness may cause the welfare losses from de-industrialization during boom periods.

It should be noted that an export boom, which by definition either involves a surge in the world price of exportables (i.e. an improvement in the terms of trade) or an increase in productive capacity in the booming sector (due to e.g. a resource discovery), has an ambiguous effect on the balance of trade. It depends on the boom's relative impact on saving and investment, which in turn depends on the expected size and duration of the boom. For booms that are expected to be short-lived ("temporary"), there is a presumption that a positive terms of trade shock will improve the current account.<sup>9/</sup> The temporary rise in income should cause an increase in current spending that is less than the gain in income. (This would certainly be true if households and governments both consumed according to the permanent income theory.) Hence, national saving should rise. This will tend to improve the current account of the balance of payments. Working against this tendency will be any increase in domestic investment resulting from the boom. The effect of the boom on investment will depend importantly on whether any credit-constraint facing firms and/or the government is relaxed during the boom. If firms face effective demand constraints in a Keynesian unemployment environment prior to the boom, the spending effect may induce significant increases in investment as firms anticipate higher future demand.

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<sup>8/</sup> See van Wijnbergen (1984) for a detailed analysis on this point.

<sup>9/</sup> Svensson and Razin (1983) show that this must be the case in a model with optimal intertemporal saving behavior by households. Investment decisions by firms and all government activities are ignored in their analysis.

The above discussion of the spending effect of the boom and its consequences concludes that real exchange rate appreciation and de-industrialization -- a sectoral reallocation of production away from tradeables towards nontradeables -- are unambiguous effects of a surge in export prices. The resource movement effect acknowledges that in some economies, the high price of the booming commodity will draw resources into the booming sector from both the tradeables and nontradeables sectors. This is important for two reasons. First, it may cause the contraction in the tradeables sector to be even more severe than it would be in the case where the booming sector is an enclave.<sup>10/</sup> Second, if resources are drawn from the nontradeables sector in order to expand booming sector production, nontradeables prices may have to rise further to clear the market. That is, the leftward shift of the nontradeables supply curve exacerbates the real exchange rate appreciation caused by the positive spending effect of the boom on nontradeables demand curve. In this case where the resource movement effect is allowed for, therefore, the net effect of the boom on nontradeables output and employment becomes ambiguous. In sum, both the real appreciation and the de-industrialization effects of the boom are strengthened when there is resource movement into the booming sector. Hence, policy concern over the potentially adverse consequences of the boom is likely to be heightened.

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<sup>10/</sup> Bevan et al. (1986) point out that some of the nontradeables whose prices rise during booms are nontradeable (or protected) capital goods. If the boom is temporary, the relative price of these capital goods will rise, not only with respect to tradeables, but in terms of nontradeable consumption goods. Two important consequences result from this shift in relative prices: (1) the proportion of the windfall that is invested rather than consumed will fall as the relative price of new capital goods rises, and (2) wealth is transferred from rural to urban residents, assuming the latter group predominates among owners of the existing capital stock whose market value has risen.

### III. DISTINGUISHING PERMANENT AND CYCLICAL SHOCKS

Before appropriate macroeconomic policies for dealing with sharp changes in the terms of trade can be formulated, at least three basic questions must be addressed. First, what is the expected duration of the shock? Is it likely to be "temporary" or "permanent?" Second, what is the degree of uncertainty about future prices and other key variables? Third, to what extent would the private sector respond sub-optimally to various shocks, if left to its own devices? Would government intervention, in the form of macroeconomic stabilization policy, for example, be welfare-improving, given the behavior of the private sector. The present section addresses the first two of these questions. They, in turn, provide essential input in addressing the third question about optimal policy responses later in the paper.

To the extent that positive shocks are perceived to be permanent (reflecting, e.g., "structural" changes in the economy) rather than cyclical fluctuations, the economy as a whole will be able to sustain permanently higher levels of consumption expenditure. Conversely, permanent negative shocks necessitate downward adjustment of consumption, not financing of now-unsustainable consumption levels. The relative responsibility of the private and public sectors for these adjustments in consumption depends more on one's beliefs about the appropriate role and size of the government, as well as long-term development objectives, rather than on countercyclical stabilization goals.

If shocks are perceived to be cyclical or temporary in nature, the optimal response for the economy as a whole is to estimate the present value

of the windfall gain (loss), and to limit the increase (decrease) in consumption expenditures to the perpetuity equivalent of this windfall. This implies a large increase in national saving during "good years." For example, assuming a real rate of interest of five percent, the warranted increase in consumption is only five percent of the present value of the windfall gain (assuming an infinite planning horizon so that the simple perpetuity formula applies). Conversely, net saving should be reduced during temporary downturns in order to prevent unnecessary sacrifices in consumption.

Needless to say, the costs of incorrectly assuming that shocks are temporary if they, in fact, turn out to be permanent may be quite different than incorrectly assuming that shocks are permanent. This seems likely, for example, in countries that undertake a lot of foreign borrowing to sustain consumption during what they perceive to be a temporary downturn. If it becomes clear later that the downturn involves a permanent reduction in income, adjustment to the new situation must occur. The reduction in financial flexibility caused by earlier borrowing may, however, make the necessary adjustments more costly or risky to implement.

There is often a strong a priori presumption about the nature of particular shocks. The 1976-80 coffee boom in Colombia, for example, was widely believed to be a temporary phenomenon rather than a permanent one, being the consequence of a major frost in Brazil, the world's largest coffee exporter. According to Jeffrey Davis (1983, p.119), for example, "The increases in export receipts that resulted from this commodity price boom were substantially greater than might have been expected from the usual cyclical movement of export prices. At the same time, the nature of the

commodity markets and past experiences should clearly have suggested the temporary, or windfall, nature of the export boom."

In the case of the 1986 coffee price run-up, analysts familiar with the crop damage in Brazil (including those at the World Bank) initially estimated that world coffee prices would remain above their normal levels for approximately two years. Estimates of both the magnitude and duration of the boom were subsequently revised downward, as Brazil's production capacity bounced back -- in fact, with a record crop -- in 1987/88. This illustrates that forecasting price movements and assessing the duration of booms is a very difficult task indeed.

An alternative to market-specific information when assessing the duration of booms is to use time-series econometric techniques. In Cuddington (1986) and Cuddington and Urzúa (1987, 1988), the problem of distinguishing permanent and cyclical changes in key economic time series for Colombia is tackled using a technique developed recently by Beveridge and Nelson (1981). Cuddington (1986) uses the technique to decompose the following variables: (i) the coffee terms of trade, (ii) real export revenue from coffee, and (iii) real GDP into permanent and cyclical components. The decomposition of real GDP is then used to assess the rationality or "appropriateness" of private and public-sector consumption spending in response to booms and busts. He concludes that both the private and public sectors tended to overconsume during cyclical upswings in income. He conjectures that this overspending may be the consequence of the relaxation of credit constraints during booms in the case of private consumption, and lack of government budgetary/administrative control over expenditures in the face of surging export revenues in the case of public consumption.

The Cuddington-Urzúa (1988) paper stresses the fiscal response to booms. Their findings indicate that Colombian government spending reflected no countercyclical tendency over the 1951-84 period. Rather there was tendency for permanent increases in spending to exceed permanent increases in national income and government revenue. Government revenue, on the other hand, did exhibit countercyclical behavior. Because permanent increases in revenue lagged the growth in spending, however, structural rather than cyclical fiscal deficits became a problem in the late 1970s and early 1980s. [The regression results suggest that for an increase in permanent government revenue of 100 pesos, government spending rose on average by 117 pesos -- a situation that is obviously unsustainable.]

Cuddington and Urzúa (1987) uses the Beveridge-Nelson method to decompose price movements for 26 primary commodities into permanent and cyclical components. This information provides policy makers with some guidance on the extent to which expenditures should be adjusted, or additional tax revenues raised, in response to booms or busts. The cyclical component of the price movements for some commodities is quite high, implying that they will ultimately be reversed, whereas for other commodities the cyclical component is small.

#### Limitations of the Permanent versus Cyclical Distinction

Much theoretical work as well as common policy prescriptions for managing resource booms emphasize the distinction between "permanent" and "temporary" (or cyclical) shocks. This distinction, for example, leads to the well-known dictum that a country should "adjust to permanent shocks, but finance [previous expenditure levels] when facing temporary shocks." In practice, however, it is often difficult to tell which shocks are which. A



Brazilian frost that reduces the country's export potential presumably creates only a temporary terms of trade improvement for other coffee exporters. If, however, the temporary production lull in Brazil sets in motion jockeying for market shares among exporters and a re-negotiation of export quotas under the International Coffee Agreement, it may well have permanent effects on the export prospects of Brazil's competitors. As implied above when discussing Brazil's rapid restoration of its export capacity following the 1976 frost, misjudgments about the degree of permanence or temporariness of shocks are all too common.

In reality, there are virtually no shocks that are truly permanent in the sense that they will prevail, with certainty, into the indefinite future. Rather one must view the world economic environment in general, and primary commodity prices in particular, as stochastic. In the special case where a particular commodity price happens to follow a random walk, all changes in the price should be viewed as "permanent" in the sense that the current price is the best predictor of future prices. Yet, future prices may be highly uncertain. Intelligent policy responses to booms take this uncertainty into account. If future incomes from commodity exports are highly variable (and unpredictable), a high proportion of any export windfall should be saved.<sup>11/</sup> This would, of course, be advisable even if the price change was deemed to be "permanent" in the stochastic sense described above.

An interesting conclusion from Cuddington-Urzúa (1987) study of primary commodity price behavior is that the simple time series models used to distinguish permanent and temporary price shocks typically explains less than

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<sup>11/</sup> This conclusion presumes the weak conditions necessary to generate a precautionary demand for saving are satisfied.

fifty percent of the total variation in the underlying data series. That is, there is a large amount of residual uncertainty. Commodity prices are inherently very difficult to forecast. Hence, recognizing and coping with the high degree of export price uncertainty may be much more important from a policy standpoint than correctly predicting the degree of permanence of a particular price shock.

When price uncertainty is large, prudent policy should, first, concentrate on generating large incremental saving during booms without worrying too much about their duration. [The strategy of sharply increasing saving is also the appropriate response for highly-certain temporary shocks.] Second, there should be an emphasis on flexibility when designing government expenditure and taxation programs. Programs that lock the public sector into large, inflexible, recurrent expenditures or irreversible or unalterable investment projects during booms should be avoided. This caveat is especially important for projects undertaken with borrowed funds, because the increased debt burden reduces financial flexibility. These fiscal strategies leave the economy vulnerable to the subsequent downturns in prices. Third, designing policy to facilitate improved risk sharing both domestically and internationally may have a high payoff. <sup>12/</sup>

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<sup>12/</sup> See Cuddington (1986, Section V) for a brief discussion of risk sharing.

#### IV. COUNTRY EXPERIENCE WITH BOOMS

Having briefly reviewed some of the key insights from the theory on booming economies and the Dutch Disease and assessed the difficulty of distinguishing permanent and cyclical shocks, it is useful to describe the typical experience of primary commodity exporters during the 1970s. The generalizations reported below are based on a detailed study of the Colombian management of coffee export booms in 1976-80 and 1985-86, as well as a less extensive comparison of changes in key macro variables before, during, and after booms in Cameroon (petroleum, coffee), Colombia (coffee), Dominican Republic (sugar), Ghana (cocoa), Indonesia (petroleum), Jamaica (bauxite), Mexico (petroleum), Nigeria (petroleum), Papua New Guinea (copper), and Zambia (copper). <sup>13/</sup> Particular attention was given to the role that public sector activity had in stabilizing or destabilizing these economies during export booms and busts.

In practice, concerns over the possibly adverse effects of a commodity export boom have centered on the tendency to overspend during and following export booms, thereby considerably reducing the total realizable gains from the boom. This overspending may be the result of excessive increases in consumption spending by either the private or public sectors, or overly ambitious and inefficient capital investment programs.

As explained above, it is natural for the real exchange rate to appreciate during booms. In many cases, however, a pronounced appreciation

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<sup>13/</sup> See Cuddington (1986, 1987, 1988) and Cuddington and Urzúa (1988) on Colombia. A brief summary of the macroeconomic effects of the 1976-80 coffee boom is given in Appendix B. The underlying data used in the cross-country comparative work are reported in the Tables in Appendix C.

is either undesirable or proves to be excessive from a social standpoint. First, the exchange rate may be overvalued at the onset of the boom so that no further appreciation is called for to restore equilibrium. This was a common occurrence in commodity exporting LDCs in the 1970s. Second, if there is excessive spending out of an export windfall due to profligate government spending, for example, the equilibrating appreciation of the real exchange rate will have to be greater than what would be required under optimal expenditure levels. This excessive real exchange rate appreciation reduces profitability in the non-booming export sector, thereby bringing about an unnecessarily large contraction in the sector's output and employment. Third, this contraction of the lagging sector may also be deemed socially undesirable if cumulative development benefits from continuous production are lost as a result of [temporary] production cutbacks. Finally, the monetary impact of the boom via its effect on the inflow of foreign reserves may cause a temporary surge in the domestic inflation rate, while the real exchange rate overshoots its equilibrium level. <sup>14/</sup>

Not only does the exchange rate appreciation often become "excessive," the high value of the domestic currency persists long after the boom has subsided, thereby preventing re-adjustment of the non-booming tradeable goods sector. The maintenance of an overvalued exchange rate may be made feasible by the large accumulation of foreign exchange reserves during the boom; this reduces the pressure on the central bank to bring about speedy depreciation of the real exchange rate after the boom. Permanently higher levels of government spending which are often initiated during temporary booms also contribute to sustained overvaluation. The Nigerian and Colombian experiences

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<sup>14/</sup> This point has been made by Sebastian Edwards (1985).

with oil and coffee booms respectively in the late 1970s are just two instances where this occurred. <sup>15/</sup>

In addition to the tendencies to overspend and allow exchange rate overvaluation to become acute during booms, there are several other common features in booming economies. The following pattern is typical, but of course the specifics vary from country to country:

- (1) Periodic surges in exports lead to large, but often very short-lived, trade surpluses or even current account surpluses -- a relatively unusual occurrence in LDCs -- as well as overall balance of payments surpluses, reflecting a large inflow of foreign exchange to the central bank.
- (2) Imports respond with a lag of a year or two to the increased foreign exchange inflow and the associated rise in national income. In many instances, the monetary authority responds to the massive inflow of foreign exchange reserves by relaxing quantitative restrictions and other regulations governing imports; most often the import of capital goods and intermediate inputs are given priority. The increased availability of foreign exchange and the overvaluation of the exchange rate, particularly if they are perceived as temporary, both contribute to surging import demand.
- (3) Rising export prices cause a jump in real national income through two channels. The first is the well-known terms of trade effect, which raises real income even in the absence of any change in output volumes. Second, there may be an impact on real GDP, i.e. real output measured in volume or constant-currency units.

Thus, in the context of commodity price booms, it is critical to distinguish between the impacts on real income and real output (GDP). The extent to which real output rises during an export boom depends on several factors:

- a) the availability of idle capacity in the economy,
- b) the extent to which unemployment in the economy is Keynesian (rather than classical or structural) in nature, as this determines whether an increase in aggregate demand due to the spending effect of the boom will stimulate output,
- c) the extent to which imports are allowed to expand to meet the higher aggregate demand. If the rise in exports is more or less

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<sup>15/</sup> See Pinto (1987) and Cuddington (1986) for the case studies.

matched by an increase in imports, the net impact on aggregate demand will be minimal. In this case where net exports are unchanged, the export boom will not succeed in raising real GDP even if there is idle capacity.

d) the monetary consequences of the boom, which will be taken up below.

Empirically, the effect of the export price surge on real output growth is often quite small and short-lived. MacBean's (1966) seminal work explored the link between export price shocks and national output in great detail using both time series and cross-country analyses for a number of commodity exporting LDCs. He found very little evidence of a statistically significant effect. Later researchers have by and large concurred with MacBean's findings.<sup>16/</sup> Perusing the Tables for various countries in Appendix C, it indeed appears that, during most of the booms studied, the response of real GDP was rather small. In some cases, e.g. Jamaica during both the 1974-5 and 1979-80 bauxite price surges, GDP growth actually turned negative. It is certainly not true, in general, that commodity price booms caused a surge in real GDP. The inflation rate (measured using the GDP deflator in the Tables), on the other hand does surge in almost every country when a boom occurred. Furthermore, inflation in the post-boom periods often remained high.

The forgoing evidence on the real output and inflation effects of booms suggests that governments interested in short run stabilization policy should focus on the inflationary consequences of the boom. Cyclical fluctuations in output and employment are likely to be mild in most cases. The monetary, inflationary and exchange rate aspects of boom management are discussed in Section V below.

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<sup>16/</sup> See Krueger (1984) for a recent survey.

This empirical evidence may seem rather surprising given the widespread policy concern over the real output and employment impacts of commodity booms in many developing countries. How can one reconcile the apparent concern of policy makers with the statistical insignificance obtained by econometric research? Perhaps it is necessary to distinguish more carefully between export booms caused by favorable terms of trade shocks and those caused by natural resource discoveries. One would expect the impact on real GDP to be larger in the case of a resource discovery, because it shifts the country's production possibilities frontier outward and leads to an increase in export volumes whereas a terms of trade shock impacts on export prices. The latter may have a significant effect on the allocation of resources, i.e. the composition of output without having a large effect on total output. (It represents a movement along the production frontier rather than an outward shift in it.) The comparison below of Cameroon's coffee price boom and oil discovery boom in the 1970s supports this conjecture.

As mentioned above, the central bank's foreign reserves typically surge at the outset of a boom. This has important monetary consequences. Unless the monetary authority is equipped with effective mechanisms for sterilizing the monetary impact of this inflow, the domestic monetary base, as well as the broader monetary aggregates will rise sharply as the foreign exchange inflow occurs. Of course, aggregate demand often increases sharply with an export boom even if heavy monetization of the foreign exchange inflow does not occur. If the real output (supply) response to this surge in aggregate demand is small, as is often the case (as discussed in the previous paragraphs), then the increase in aggregate demand is felt primarily through its impact on the domestic inflation rate. Indeed it is typical for

inflation to surge during booms. (Any increase in real money demand is likely to be modest in cases where the real output growth is low and the inflation rate rises.) The inflationary impact of the boom can be greatly exacerbated by the stance of the monetary authority. Attempts to maintain a fixed nominal exchange rate, particularly when coupled with foreign exchange regulations that force exporters to convert export proceeds into local currency within a short period after receipt, generally lead to higher inflation relative to regimes where some upward adjustment of the nominal exchange rate is permitted. <sup>17/</sup>

The boom's impact on the structure of demand, including its breakdown into consumption and investment and its division between private and public expenditures, depends on initial distribution of windfall gain. Here national practice varies widely. In countries that export mineral products there seems to be a tendency towards public ownership of resources in the booming sector. The petroleum sectors in Indonesia, Mexico, and Nigeria are examples of countries where public enterprises control the primary export sector. In the case of agricultural commodities, on the other hand, private ownership is more common, although government involvement in setting producer prices is widespread. By setting the level of producer prices relative to world market prices, government policies affect how much of the surge in export earnings remains in the hands of producers and how much is taxed away and redistributed. In Colombia, for example, the powerful coffee lobby insisted that the export gains remain in the coffee sector during the 1976-80 boom and

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<sup>17/</sup> See Neary and van Wijnbergen for a discussion of fixed versus flexible exchange rate regimes in coping with booms. See Cuddington (1987) and Appendix A for a discussion of the impact of foreign exchange controls on boom management.



the 1985-86 mini-boom. Through agreements between the National Coffee Federation and the central bank and national government, however, mechanisms were devised to facilitate financial intermediation of the windfall from coffee exporters towards priority investment projects elsewhere in the economy. In Africa, the differing distribution of the coffee windfall between producers and the government in Kenya and Tanzania makes an interesting policy contrast:

In Kenya, the coffee boom amounted to a terms of trade gain of K£339m (m=million; 1975 prices) in the 1976-79 period, equivalent to 32 percent of 1975 gross domestic product (GDP). While in Tanzania the price increase was largely taxed away, in Kenya the producer price of coffee rose almost as much as the world price so that coffee producers, predominantly smallholders, were the initial beneficiaries of the boom." (Bevan, Collier, and Gunning, 1987, p.491).

Of course, even in countries where the government is not a major initial recipient of the boom income, its revenues from import tariffs as well as income and sales taxes will generally rise as private spending increases. Government policies can have a profound impact on the ultimate distribution of the windfall, even when the boom income accrues initially to the private sector. As Bevan et al. (1987, p.510) emphasize in their study of Kenya:

On theoretical grounds we would expect the use made by private agents of a temporary windfall to be strongly influenced by the presence of government controls on assets and international trade. Our investigation of the Kenyan coffee boom has lent support to the theoretical analysis and has indicated that such considerations may be quantitatively important. Kenyans indeed appear to have attempted to save a high proportion of their windfall incomes (around 60 percent), but their asset choices were so restricted that this drove up the relative price of nontradeable capital goods. Similarly, as their attempts to increase consumption were constrained by import controls, there were short-run redistributions in favor of domestic producers of import-substitutes. In the longer run, the skewed sectoral allocation of windfall investment produced further powerful redistributions. ...Conventional wisdom would imply that most of the benefits would accrue to coffee and tea growers since the Kenyan government chose

to pass the rise in world prices on to farmers. Yet our model indicates that the effects of the boom depend critically not just on producer pricing, but also on trade policy and investment allocation. The distortions created by these policies cause a very large part of the total gain to end up in urban rather than rural hands.

### The Effect of External Shocks on the Public Sector

We now turn to the budgetary consequences of the boom and the policy response of the public sector. The analysis of fiscal policy in commodity-exporting countries might begin with three questions:

1. To what extent has the public sector response to booms contributed to short-run "instability" -- where instability is defined here as either internal and external disequilibrium? Is this response a deliberate policy action or is it the consequence of automatic stabilizers (or destabilizers) in the economy's fiscal structure?
2. If government activity has been destabilizing, how can fiscal policy be modified so that the public sector plays a positive rather than negative role in an economy attempting to maximize the potential gain from temporary export booms?
3. Is there reason to believe that private sector response to export booms has been suboptimal? If so, is there room for active stabilization policy designed to alter private consumption and/or investment behavior? If not, the primary objective of fiscal policy should be insuring self-restraint by the public sector and good administrative control of the budget process so that the budget remains roughly in balance over time.

Vito Tanzi (1986, p.88) recently noted that "the automatic impact of external shocks [such as changes in the terms of trade, major import prices, the cost or availability of foreign capital, etc.] on the fiscal variables is likely to be much more important in developing countries than in industrial countries. At the same time the ability of developing countries to neutralize these effects, if they wished to do so, is much more limited." Because the impact is much more direct and automatic, it is important not to assume that changes in fiscal variables represent discretionary policy

responses to the external shocks. Tanzi lists a number of reasons for the close link between the budget and the external sector in LDCs, among them the high proportion of foreign trade taxes in total revenue. He estimates, "More than 50 percent of the tax revenue of developing countries may be directly related to the foreign sector." (p. 89) Ideally, one should distinguish endogenous changes in the government's tax revenue and expenditure from discretionary decisions to change fiscal policy stance. Tanzi's point is that there are major endogenous changes in the budgetary situation in response to exogenous shocks. These effects do not necessarily act like automatic stabilizers; in fact, they may exacerbate the disequilibria initiated elsewhere in the economy.

Tanzi's analysis of the impact of higher export prices on government revenues and expenditures during the 1970s distinguishes three different types of response by various LDCs:

A first (and very small) group considered the increase as a temporary windfall which would affect only marginally the permanent income of the country and of the government. These countries used the additional revenue to pay off foreign debt or to accumulate foreign assets (in the form of foreign exchange or in real assets). These assets could be liquidated in future years when foreign earnings declined in order to maintain the level of domestic spending on some, hopefully permanent, trend. This behavior is an application of the permanent income hypothesis of consumption to the government.

A second, and larger, group engaged in capital accumulation at home by expanding the level of public investment. Provided that the investment has as high a rate of return as what the country could have received from foreign assets, that the "additional" investment spending is limited to the windfall income, and that this spending can be phased out when the windfall income begins to disappear, this policy response can also be considered as a good one. However, experience indicates that often the requirements mentioned above were not met. Investment was often not as productive as it could have been having been distorted by poor management and by political considerations; it was often too large; and it was too rigid to be phased out when needed. These countries faced difficulties when the windfall disappeared and foreign financing

dried up. These changes would have required a quick reduction of the investment expenditure.

A third and largest group increased public spending by increasing public employment, increasing the size of transfers, increasing investment, and so on. In this particular situation, when the decline in foreign earnings inevitably came, the countries were tied to patterns and levels of spending that were very difficult to change. As long as foreign loans were available, the countries used this source to maintain the level of spending that could not longer be maintained with ordinary revenue. This reaction postponed the problem and in many cases made it worse by leaving the countries with huge foreign debts. When the crisis came, and the countries found that they had to adjust, as financing was no longer available, the consequences were very serious.

Shocks that reduce public sector revenue are even more difficult to deal with. In this case, the countries are often unable to make up the revenue losses in the short run. The losses of foreign trade taxes could in theory be compensated by increasing income taxes or taxing domestically produced products. But income taxes take a very long time to introduce and collect, and their scope in LDCs is limited. For this reason, countries have often been forced to rely on inferior revenue sources such as inflationary finance, regressive excises, or the building up of arrears. (pp. 90-91).

Tanzi's discussion favors the first and second strategies of the three described above but give no guidance as to when each is preferred.

Cuddington (1986, 1987, 1988) suggests the first strategy is superior for countries that do not impose foreign exchange controls on capital inflows and outflows and do not face credit constraints (i.e. binding country lending limits) in the world financial markets. In this situation the bulk of the temporary windfall should be saved and this saving should take the form of increased holdings of foreign assets and/or a reduction in foreign liabilities. Relatively small amounts of saving should be allocated to increased domestic capital formation, at least in the short run while the boom is occurring. If the country has binding capital controls or faces credit rationing, on the other hand, the shadow domestic interest rate and the marginal productivity of domestic investment may be considerably greater

than the world interest rate. In these circumstances, it is optimal to allocate much of the windfall saving to domestic rather than foreign investment, although the appropriate timing of this increased investment must still be considered. If the absorptive capacity of the economy is limited, the optimal strategy is to initially invest the windfall saving in foreign assets and then to gradually undertake domestic capital formation at an optimal rate, recognizing its impact on aggregate demand and absorptive capacity.

The potential public expenditure controls problems associated with booms have long been recognized. Corden (1984, p.359), for example, comments: "it might be argued that the true Dutch Disease in the Netherlands was not the adverse effects of real appreciation but rather the use of Booming Sector revenues for social service levels which are not sustainable, but which it has been politically difficult to reduce." In a study of booms in sub-Saharan Africa, Anand Rajaram (1985) reaches similar conclusions. Not only does he note the prevalence of large increases in government spending during booms, he claims that much of the sharp appreciation in real exchange rates is caused not by the commodity boom itself but by the large increases in government expenditure which fall disproportionately on nontraded goods. After studying the adjustment of Nigeria to the oil price boom and of Kenya, Cote d'Ivoire, and other African exporters to the 1976-77 coffee price boom, he presents the following as stylized facts (p.3):

- (1) A boom in the price of an export commodity was the "shock" that resulted in a dramatic increase in foreign exchange earnings. Much of this windfall was collected by the government [in the countries he studied].
- (2) In most countries this windfall led to very large increases in government spending, with a bias towards the non-traded sector. This was the initial policy response.

- (3) The end of the boom was marked by a large decline in foreign exchange earnings and government revenue. This constituted a second shock.
- (4) The policy response to this shock was to continue the spending levels inherited during the boom period. This necessarily meant large budget deficits, monetary expansion and rising inflation.

It might be noted that the real exchange rate overvaluation caused by increased government spending will be exacerbated to the extent that the public sector finances deficits by borrowing abroad. (The capital inflow must be accompanied by a rise in the real exchange rate to effect the transfer.)

In light of these comments, the response of government expenditures, revenues and the deficit during boom episodes shown in Appendix C are informative. The following generalization emerges. During booms, the ratios of both government spending and revenue to GDP typically rise, with the expenditure ratio growing more rapidly than the revenue/GDP ratio. Thus, in spite of the additional revenue secured during booms, government expenditure increases quickly outstripped the gain in revenue. Booms are, therefore, accompanied (with a slight lag) by a rise in the fiscal deficit -- just the opposite of what one would expect based on the consumption smoothing, i.e. permanent income, strategy discussed above.

As the booms subsided, moreover, the fiscal deficit often stays large, suggesting that booms may set in motion long-run fiscal problems if not well managed. In short, the lack of fiscal control in booming economies is a major problem. It can significantly reduce or even negate the economy's total gain from commodity export booms.

The remainder of this Section briefly summarizes the experiences of Kenya, Nigeria, Jamaica, and Cameroon in dealing with export booms and busts, with emphasis on their fiscal policy responses. The first three countries are examples of rather poor fiscal management that led to long-term structural difficulties. The case of Cameroon is one of adept and timely macroeconomic management. In addition to these cases, Appendix B considers in greater detail Colombia's 1976-80 coffee boom. Although the policy response to the boom was not without shortcomings, Colombia's experience must be viewed favorably in comparison to that of other primary commodity exporters that boomed in the 1970s. 18/

#### Kenya: The Distribution of the Windfall and Fiscal Control

The Kenyan coffee boom in the later half of the 1970s illustrates that fiscal control problems can arise even when the initial windfall accrues to the private sector. Kenya was rather unusual in that farmers received the full world price for their coffee, after deducting marketing and processing costs. Bevan et al. (1986) note, "There were no attempts to sterilize the coffee money by putting it in, for example, some form of stabilization fund, although the Central Bank argued for this and also the IMF suggested something of that nature. The government, however, refused to take any such action and decided to let all the gains be passed on to the farmers..." (p.32) In spite of the fact that the government was not a direct recipient of the coffee windfall, its revenues from other taxes rose substantially. Unfortunately, this contributed to and accelerated the breakdown in the government's control over public expenditures. Bevan et al.

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18/ See Larrecq (undated) for a detailed analysis of the much more varied experiences of commodity exporters in western Africa.

stress this political economy aspect of the budget process:

[It] reflected the political difficulty of holding back expenditures in an economy with many obvious needs, when it was widely known that the Treasury had access to extra money. In an attempt to make it more difficult for the Treasury to cut down their requests, spending ministries refused to rank projects in any priority. The Treasury therefore had to enforce spending ceilings on ministries with little guidance about the relative merits of proposals. Not only did many bad projects thus come to be retained, but the net effect was for the Treasury to err on the side of extravagance. (1986, p.35).

This lack of budgetary control ultimately lead to an economic crisis in the early 1980s:

Our interpretation of the events...[is] that the coffee boom was the root cause of the 1981 crisis, while the crisis of the mid-1970s was a smaller adjustment problem. The boom led to a breakdown of control over public expenditure, which was not restored until 1983. There was an expansion of the public sector considerably in excess of what was sustainable under normal circumstances, and additionally private demand expanded too rapidly. The boom thus caused the serious disequilibrium in the economy. As a result of the boom the government became unable to handle its finances in an efficient and responsible way, and in consequence was unable to handle the second oil [import] price shock efficiently. (Bevan et al., 1986, p.53)

Clearly, the Kenyans suffered from the type of "Dutch Disease" described by Corden above: an inappropriate fiscal response to the boom. With the benefit of hindsight, the coffee boom of the 1970s must be viewed as a major missed opportunity to accelerate the country's economic development.

### The Nigerian Experience

Nigeria provides a clear example of heavy fiscal dependence on primary export earnings and the lack of expenditure restraint accompanying export booms. According to Rajaram (1985, pp.15-16), "In the nine-month period before mid-1974, Nigerian government oil revenues almost quadrupled, the rise being due to the oil price increase, increased production and greater tax, royalty and ownership shares in oil revenue. The balance of payments surplus increased by a factor of 20 correspondingly."



The government responded with a large expansion in non-tradeables expenditures. "A very large part of the spending was on education, transport and communication, and construction (military barracks, conference centers). The Udoji Commission's recommendations also increased the public sector wage bill by almost 60 percent...The income created by the spending increased demand for food and with domestic supplies being inelastic in the short run this quickly spilled over into imports. Port and transport bottlenecks were quickly reached and food prices began rising. Inflation received further impetus from the high level of government expenditure which, having overtaken revenue, had pushed the budget into a deficit. The monetary expansion fueled the inflationary spiral." (Rajaram, 1985, p.16) As Table 2 shows, foreign exchange reserves began to decline abruptly in 1981, and the government resorted to large amounts of external borrowing rather than curtailing expenditures to sustainable levels.

Federal government oil revenues, predominantly from the petroleum profits tax, royalties, and the profits of the Nigerian National petroleum Company averaged 68 percent of total federally retained revenue (after subtracting revenue collected by the federal government and passed on to state and local governments under revenue sharing agreements) during 1981-86. The fall in world petroleum prices in the 1980s has resulted in a significant erosion of the revenue base. After a 22 percent increase in 1980, oil revenue declined by 30 percent in 1981-83. In 1984, however, revenues jumped 30 percent due to a sharp increase in production volume and the effect of exchange rate changes.

In Nigeria, as in other primary commodity exporting countries, the link between exchange rate policy and government revenue is important. When

Table 2

NIGERIA  
Foreign Reserves and External Debts

	1970	1975	1980	1981	1982	1983	1984	1985
International Reserves	223.3	5006.1	10840.0	4100.1	1926.9	1252.1	1673.8	1891.8
Total External Debts: Short and Long Term	na	na	9887.9	12039.0	12445.1	17985.2	18223.7	19347.8
Reserves Less Debt	na	na	1752.1	-7870.9	-10518.2	-15733.1	-16549.9	-16456.0

Sources: World Debt Tables, 1986-1987 edition, pp.146-148

\* Virtually all of Nigeria's long-term debt is public or publicly guaranteed debt. Private nonguaranteed borrowing abroad is negligible.

export booms lead to exchange rate appreciation, the government revenue base is eroded. In addition to limiting the naira value of petroleum revenues, Nigeria's currency appreciation lowered revenue from ad valorem import duties and switched profits from the relatively taxable manufacturing sector to the untaxed commercial and distribution sectors. This caused federally collected revenue to fall from about 25 percent of GDP in 1981 to 20 percent of GDP in 1985. The revenue/GDP ratio did, however, improve sharply to 24 percent in 1986 as a result of the substantial devaluation experienced in the last quarter of the year, and efforts to widen the tax base. The sensitivity of government revenue to the exchange rate suggests that countries that manage to avoid overvalued exchange rates during booms will have a considerably easier time preventing fiscal problems from arising. This assumes, of course, that the government succeeds in limiting expenditure if revenues remain intact.

#### Jamaica: Booms and Economic Stagnation

The contrast in Jamaica's growth performance in the 1960s compared to the 1970s and first half of the 1980s is striking. In the 1960s, the economy experienced positive growth in every year except 1963 when it dropped slightly, before surging ahead at a 12.3 percent rate in 1964. In the 1970-85 period, on the other hand, real growth languished, dropping by as much as 5 or 6 percent in several terms. This stagnation has also been accompanied by considerably higher rates of inflation than those prevailing in the 1960s, or those prevailing in the industrial countries during the 1970s for that matter. (See the Jamaica Table in Appendix C.)

The long-run trend in Jamaica's fiscal situation is equally unfavorable. The ratio of the fiscal deficit to GDP was generally 2-3 percent in the

1960s. It began to climb in the early 1970s: from 2.7 percent of GDP in 1970, to rose to 5.3 % in 1973. As Jamaica's bauxite earnings surged in the 1974-75, the fiscal deficit rose to 7.9 percent. As the boom ended, the deficit ballooned to 15.5 % of GDP as a revenues turned down while expenditures increased sharply. As the Table shows, a second bauxite boom in 1979-80 did nothing to improve the fiscal balance. The deficit rose to 20.8 percent of GDP in 1980, as expenditures outstripped the revenue gain associated with the boom.

As we have seen, during both booms, Jamaica's fiscal deficit to GDP ratio actually rose relative to its pre-boom level. Conventional stabilization policy would have dictated a reduction not an increase in the deficit ratio. Clearly, this fiscal policy stance during the boom and post-boom periods was anything but stabilizing.

It is interesting to note that the perceived need for countercyclical stabilization policies depends importantly on whether one focusses on real GDP growth, domestic inflation, or the surge in export prices and volumes. As the summary data Table on the booms indicates, real GDP growth dropped during both the 1974-75 and 1979-80 booms. Inflation, on the other hand, rose, particularly during the 1974-75 episode -- presumably as much a result of higher world prices for imported oil as the bauxite export boom. Thus, it is unclear what countercyclical adjustment in fiscal policy would have been warranted. What is clear, is that the secular deterioration in the country's fiscal position has been a major contributor to the unsustainable external imbalances currently plaguing the Jamaican economy.

Thus, in spite of two export booms in the 1970s, Jamaica's fiscal position worsened dramatically, as control over public expenditure waned, and

slow revenue growth was accompanied by heavy dependence on foreign borrowing by the public sector. This "ratchet effect" of increased government spending during booms, which proves difficult to reduce once the booms subside is all too common. In Jamaica, as in other commodity-exporting countries, this fiscal problem had important financial consequences. Between 1970 and 1980, Jamaica's public and publicly guaranteed long-term debt rose from 30.2% of exports (of goods and services) and 12.0% of GDP to 101.2% of exports and 60.0% of GDP. The debt burden became even more onerous in the early 1980s as traditional export markets for bauxite and alumina faced dismal growth prospects and the government failed to correct growing fiscal imbalances and a severely overvalued exchange rate.

When a new government came to power in October of 1980, it attempted to reduce the role of the public sector and create a policy environment more conducive to rapid growth in the export oriented sectors of the economy. Between 1980 and 1985, however, the progress on this front was minimal. Management of the economy in the face of greatly reduced capital inflows from abroad and the need for repeated rescheduling of existing external obligations became the primary concern of policy makers. Given the country's debt servicing burden, the fiscal authorities had little financial or fiscal flexibility to conduct countercyclical stabilization policy in the recessionary domestic environment prevailing in the first half of the decade. Furthermore, even the narrower objective of restoring fiscal balance was made considerably more difficult by the debt overhang and the large, nondiscretionary costs that debt servicing implies for the budget.

### Cameroon: A Case of Adept Boom Management

Cameroon's experience with commodity export booms during the 1970s is interesting for a number of reasons. First, it had two positive shocks: a coffee price boom in 1976-77 and an oil boom in 1979-80. (Cameroon did not export oil prior to that time.) Second, while the former was a price shock, the latter involved exploitation of new offshore oil reserves beginning in 1978. Benefits of Cameroon's new oil export capability were greatly enhanced by the sharp run-up in world petroleum prices in 1979-80. Finally, Cameroon's management of these back-to-back booms was exemplary. Largely through prudent fiscal policy, it avoided many of the adverse consequences of booms experienced by other commodity-exporting countries.

Assessing Cameroon's growth performance is difficult because of data accuracy problems.<sup>19/</sup> The real GDP growth figures reported by the IMF's International Financial Statistics differ considerably from those in the World Bank's Country Economic Memorandum (CEM), as the Table shows. Nevertheless, the data, such as they are, suggest that real GDP growth dropped during the 1976-77 coffee boom. As explained above, it is not uncommon to see very little or no surge in real GDP in response to a sharp rise in the world price of a country's primary export commodities. Although there may be some reallocation of resources, the overall level of capacity utilization need not be greatly affected, particularly if the economy is near full employment or if unemployment is structural in nature. Hence, although national income rises, real domestic product may show little change.

In contrast, the 1979-80 boom initiated by the expansion in oil

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<sup>19/</sup> These problems are discussed in Cameroon: Country Economic Memorandum. The World Bank, Report No. 6395-CM, February 19, 1987.

production capacity apparently caused a sharp increase in real GDP. The CEM data (which I suspect are superior) indicate an increase in real GDP, rising from 2.9 in 1975-78 to 14.9 percent during 1979-80 and then falling to 7.3 percent in 1981-83 as world oil prices declined from their peak.

A comparison of Cameroon's two boom episodes supports the conjecture above that commodity price booms, compared to booms caused by exogenous volume increases, often have only modest impacts on real output. In the face of price or "terms of trade" shocks, therefore, stabilization policies should focus on the inflationary and external balance consequences of booms rather than their effects on output and employment. In the case of booms caused by resource discoveries, on the other hand, more emphasis on the latter effects is warranted.

In their comparative study of boom management in Cameroon, Cote d'Ivoire, and Senegal, Devarajan and DeMelo (1987) conclude that Cameroon's macro management during the 1970s was first-rate. The increase in spending associated with the boom was modest; the government budgetary situation which was conservative prior to the booms remained so throughout the 1970s; the real exchange rate did not appreciate sharply, in contrast to the typical pattern in booming economies (including Cote d'Ivoire and Senegal). They point out that the initial windfall from the coffee boom in Cameroon and the windfall from the coffee and cocoa boom in Cote d'Ivoire accrued to their commodity stabilization funds, as prices paid to domestic producers were kept below prevailing world prices. Whether this results in a moderation of the spending effect of the boom (relative to a situation where the bulk of the windfall accrues directly to the private sector, as happened for example in the case of the 1973 phosphate boom in Senegal) depends critically on how the

public sector uses the additional resources. In Cameroon, current expend'ture by the government was restrained so that substantial public saving occurred, and a large fraction of the windfall was invested in domestic capital formation thereby minimizing the need to borrow abroad. According to Devarajan and DeMelo (1987, p. 451).

The post-1978 oil boom was of much greater significance but elicited a similar response. While estimates vary, there is reason to believe that up to three-fourths of the oil revenues were saved abroad...In fact, the government has used the oil revenues to retire a small part of its foreign debt. Consequently, in contrast to other oil exporters' experiences, Cameroon's real exchange rate continued to depreciate...in the first few years of the oil era (see [their] figure 1). To the extent that this windfall was spent domestically, it was channeled into investment rather than consumption; while the share of public expenditure in GDP fell slightly between 1978 and 1982, that of public investment almost doubled.

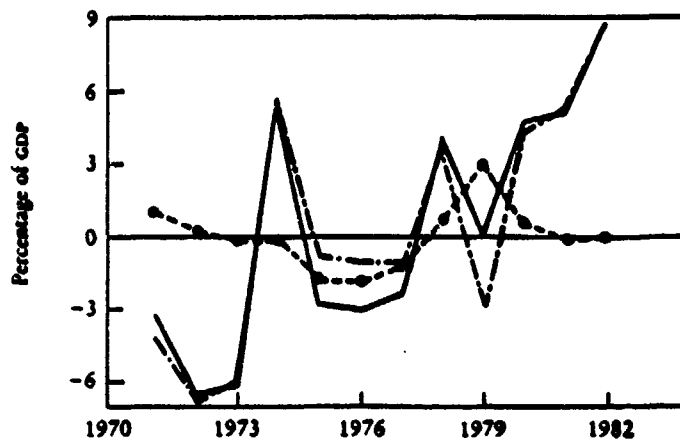
In fact, capital expenditure grew fourfold between 1978 and 1981 but then ceased to grow in real terms, the authorities having recognized the constraints on their capacity to absorb efficiently investment at these levels.

The fact that Cameroon was able to prevent the sharp currency appreciation that typifies commodity export booms is especially noteworthy because the country has a fixed exchange rate, being a member of the CFA zone. Gradual real depreciation occurred, implying that internal prices of tradeables were rising or nontradeables prices were falling. Our data Table indicates that Cameroon's inflation rate dropped slightly during the 1979-80 boom, although it rose sharply in the post-boom period. This suggests that prices of nontradeables were probably rising, but at a slower rate than tradeables prices and, hence, the overall price level. Regarding tradeables prices, the government used some of its liquid assets resulting from the oil bonanza to raise producer prices of cash crops, keeping the real exchange



Figure 1 (continued)

Decomposition of net domestic savings (by public and private sources)



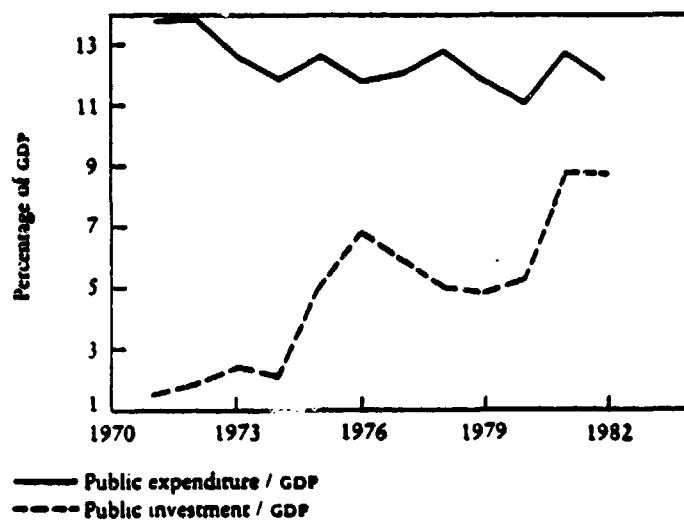
Note: All are measured as percentage of GDP.

----- Federal government budget surplus

-.-.- Private sector surplus of savings over investment

———— Trade account balance

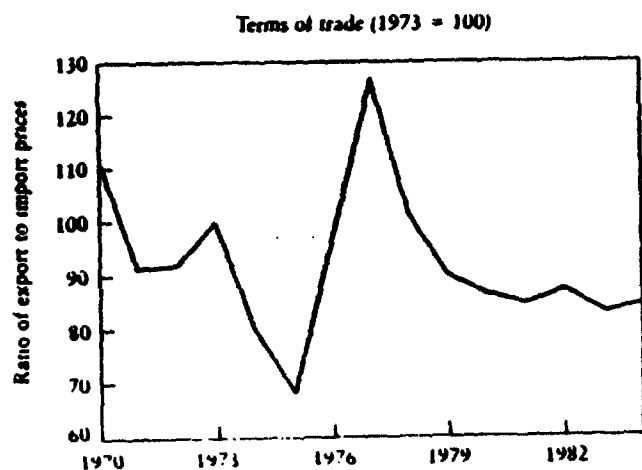
Public expenditure and investment (shares in GDP)



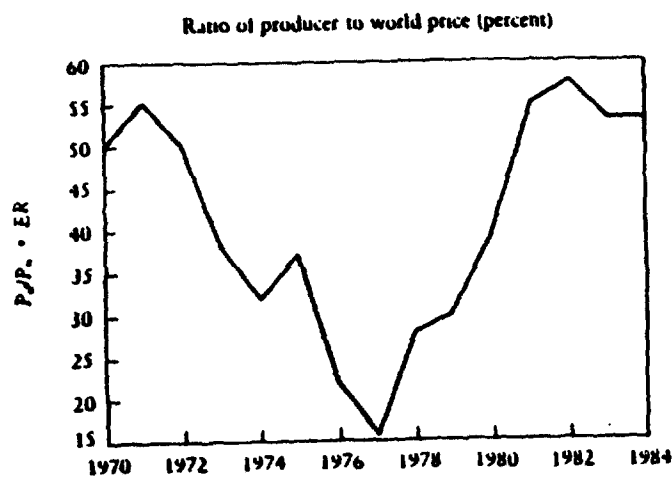
———— Public expenditure / GDP

----- Public investment / GDP

Figure 1.\* *Adjustment Indicators for Cameroon*

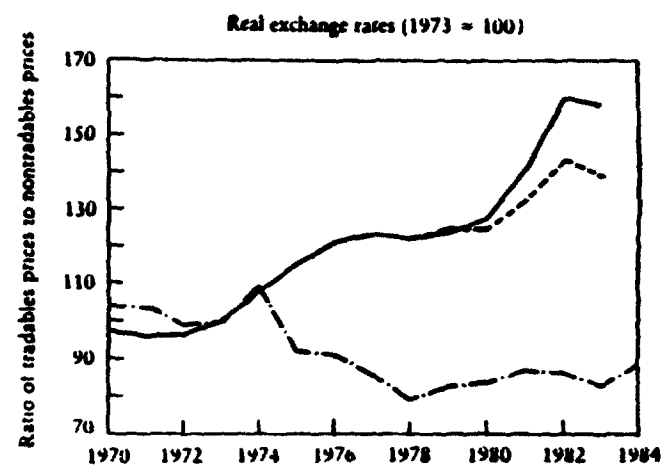


Note: Weighted index of prices of exported commodities to imported commodities.

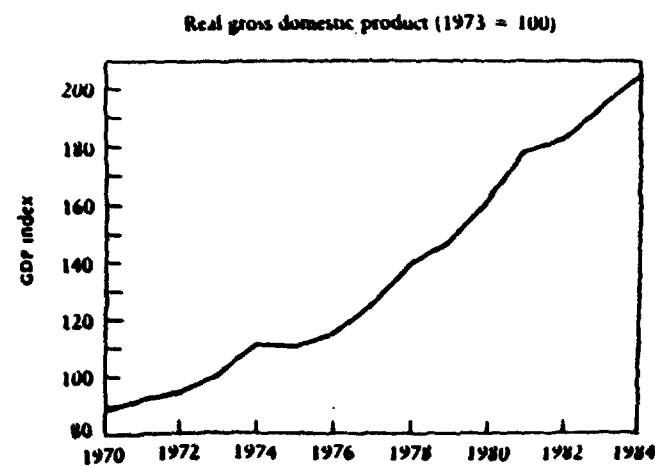


Note: For coffee and cocoa,  $P_d$  = domestic producer price;  $P_w$  = world price; ER = nominal exchange rate.

Figure 1 (continued)



— Price of tradables / price of nontradables  
 ---- Price of tradables (excluding mining) / price of nontradables  
 -.- Manufacturing competitiveness index: import-weighted manufacturing wholesale price index of trading partners / domestic manufacturing wpi (a decline indicates a loss of competitiveness)



Note: Change in GDP from 1973 base value.

rate from appreciating and preventing the traditional export sector from contracting Dutch disease. (Devarajan and DeMelo (1987, p. 455).

Although government revenues in Cameroon reflect royalties and taxes on the four oil companies operating in the country, the government's revenue from the sharing of production is channeled into extra-budget accounts. The total amount of these revenues is not divulged. While this secrecy has potentially dubious effects on the responsibility and accountability for public revenues, it does presumably have the benefit of reducing various pressures to increase government spending, which emerge once it becomes clear that the government is flush with funds. (This was, for example, a major problem in Nigeria, where there was a complete breakdown in the budgetary control process as the oil revenue flowed in.)

In spite of the overall success of its policies, there are a couple of areas where Cameroon's public expenditure response to the oil boom has been less than ideal. Over the 1979-85 period, current expenditures rose in tandem with total government receipts. There was a particularly sharp rise in "subsidies and transfers," made up in large part of operating subsidies to the public enterprises, many of which are inefficiently run and generate losses. Another source of concern is the rapid increase in the number of permanent civil servants, presaging a heavy burden for the future as oil revenues decline. The issue here is how to maintain flexibility of current expenditures so that they can be adjusted as the export environment changes. [This point was discussed in Section III in the context of distinguishing permanent and temporary shocks.]

## V. APPROPRIATE POLICY RESPONSES <sup>1/</sup>

The review of country experiences above gives considerable insight into the types of policy responses that stabilized rather than destabilized commodity exporting LDCs facing terms of trade shocks. Nevertheless, it may be helpful to consolidate the findings in the form of more general lessons or principles involved in boom management. That is the purpose of this Section.

When discussing primary export booms, it is helpful to consider the appropriate response for the economy as a whole, before highlighting the possible roles of the private and public sectors. At this level of aggregation, macroeconomic policies should be designed to achieve three broad objectives:

- (i) limiting increases in consumption expenditures,
- (ii) allocating the resulting increase in domestic saving efficiently among alternative uses including: increases in official reserves and other foreign assets, reductions in foreign liabilities, increases in domestic capital investment, and supporting programs in trade, financial, and exchange rate liberalization,
- (iii) coping with the monetary, inflationary, and exchange rate aspects of the booms.

At the more disaggregated level, three additional sectoral objectives should be addressed:

- (iv) improving the sectoral allocation and timing of domestic investment,
- (v) maintaining a reasonable "balance" between the public and private sectors of the economy,
- (vi) setting producer prices (relative to world prices) to achieve an efficient production response, on one hand, and appropriate levels of saving by commodity

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<sup>1/</sup> This section is adapted from Cuddington (1988).

The discussion below follows the list of broad macro objectives above, with the sectoral objectives interspersed at the appropriate points.

### Limiting Increases in Consumption Expenditure

A top priority during temporary export booms is to prevent excessive increases in consumption expenditures, thereby sustaining higher consumption after the boom subsides. Based on the principle of consumption smoothing, which is welfare-increasing as long as there is diminishing marginal utility of consumption at the aggregate and intertemporal levels, the correct policy is to insure that a large fraction of the windfall is saved rather than consumed. This principle is worth emphasizing because excessive increases in current spending have been the typical experience in most developing countries during booms.

It is not uncommon for total (private and public) consumption as a percent of GDP to dip briefly but then rise sharply as the boom matures and subsides.<sup>2/</sup> Parenthetically, the finding that the consumption to GDP ratio falls during a boom is not proof that the consumption response is appropriate. After all, the consumption to GDP ratio will fall following a surge in income as long as the marginal propensity to consume is less than the average propensity. If the rise in income is temporary, the optimal marginal propensity to consume should be much less than the average propensity, causing a large drop in the consumption ratio. In Colombia, for example, the consumption ratio, which hovered around 80 percent prior to the boom, dropped briefly to 78 percent at the peak of the boom in 1977, but then rose steadily

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<sup>2/</sup> Public consumption refers to expenditures on currently produced goods and services which do not constitute additions to the public sector's capital stock.

to 84 percent in 1982 -- 4 percentage points above its pre-boom level. It was 83 percent in 1983, and then fell gradually thereafter as the country headed into a growth recession. A detailed analysis of the response of consumption to temporary, as opposed to permanent, changes in GDP indicates that both private and public consumption in Colombia increased by more than sustainable levels during the coffee boom of the 1976-80 period. (See Cuddington (1986)). This increase in consumption above sustainable levels necessarily implies levels of consumption at some point in the future.

How can policy makers determine whether or not increases in consumption expenditure are excessive? To determine whether overconsumption is, in fact, occurring during booms, it is natural to assume that the ultimate objective of policy makers is to maximize an intertemporal welfare function that depends on aggregate private and public consumption in each period:

$$U = \sum_{t=0}^{\infty} u(C_t, G_t)$$

Under the assumption that there is diminishing marginal utility of private consumption as well as public consumption at the aggregate level, efforts to smooth consumption intertemporally in the face of income shocks, such as those caused by terms of trade shocks, will be welfare improving. Suppose one makes the additional assumptions that (i) the demands for private and public consumption each have a unity income elasticity of demand<sup>3/</sup> and (ii) the relative price (opportunity cost) of publicly provided goods in terms of

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<sup>3/</sup> The Pleasure Effect, of course, claims otherwise. It hypothesizes that the public sector share in GDP tends to rise as per capita income rises, implying that a corresponding fall in the private consumption ratio.

private goods remains roughly constant over time (independent of whether booms or busts are occurring). With these additional assumptions, welfare is maximized by a strategy that not only smooths private and public consumption intertemporally, but also keeps their respective shares of GDP roughly constant during temporary export booms or busts.<sup>4/</sup> If one sees a sharp increase or decrease in the public consumption share, after accounting for any countercyclical stabilization policy that may be warranted (which, by the way, would tend to reduce -- not increase -- government spending), there is a strong a priori presumption that the increase in public consumption is excessive.

The pattern of public and private in Colombia before, during, and after the 1976-80 coffee boom provides a striking example. The share of central government consumption rose sharply from 8 percent in 1977, the peak of the boom, to almost 12 percent by 1983. (Because these figures refer only to the central government, they do not include increases in public consumption). Even as the boom subsided, the ratio of government consumption). Even as the boom subsided, the ratio of government consumption to GDP continued to rise. This phenomenon is not unique to Colombia. Rajaram's 1985 study of Sub-Saharan africa finds a similar pattern: government expenditures surge during booms, and are very difficult to cut back after the export boom ends.

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<sup>4/</sup> This point has been emphasized in Cuddington (1986) where it is argued that the difficult political economy question of the "appropriate" size for the public sector should be kept distinct from the question of how to manage temporary export booms. During booms, the argument in the text suggests that the relative shares of the private and public sector in total consumption should be held roughly constant. A massive expansion in the public sector, which often occurs during booms, should be considered undesirable. It is self-delusion to justify it on the grounds that the size of the public sector was in fact too small prior to the onset of the boom.

Assuming consumption smoothing is a desirable social objective, the question arises whether there is a role for government policies in facilitating consumption smoothing by the private sector or whether the private sector is able to achieve an optimum intertemporal allocation of consumption on its own. In the latter case, the sole role of the government would be to insure that its own consumption expenditure decisions were optimal from a social standpoint.

Given the widespread problem of expenditure control by the public sector during booms, the potential for active stabilization policy of the aggregate demand management variety may be rather limited in most commodity-exporting LDCs. It should be emphasized, however, that if expenditure controls can be achieved, the automatic stabilizers in the tax and transfer system will sometimes be adequate to prevent excessive increases in aggregate demand following a run-up in export earnings. If automatic stabilizers are insufficient, steps might be taken to improve the buoyancy of the tax system, thereby increasing the efficacy of automatic stabilizers.

The case for policy intervention to stabilize or smooth private consumption is greatly strengthened in situations where (i) the government itself has demonstrated good expenditure control during boom periods, acting at least neutrally if not countercyclically and (ii) the private consumption behavior deviates from the predicted by the permanent income hypothesis, it is much more difficult to make the case that government intervention will be welfare improving.<sup>5/</sup>

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<sup>5/</sup> Weissenberger (1986) and Cuddington (1986) elaborate on this point.



To determine sustainable levels of consumption, the permanent income theory serves as a useful benchmark. This theory gives rise to the following simple rule-of-thumb:

limit the increase in national consumption expenditure to the  
perpetuity-equivalent of the windfall gain <sup>6/</sup>

Technically, this benchmark is only appropriate for countries that do not face quantitative limits on credit in the international capital markets, as was true in Colombia, for example, during the 1976-80 coffee export boom. Modification of the rule for countries facing foreign borrowing constraints and domestic credit rationing is briefly discussed below.

Using the perpetuity rule, it is straightforward to calculate the sustainable increase in consumption resulting from the boom. First, estimate the duration of the boom, the year-by-year increase in export revenue, and the resulting increase in real GDP (taking into account any multiplier effects, which depend on the level of idle capacity and unemployment). This should be done with reference to a "no-boom" scenario to avoid the error of attributing entire growth in these variables to the boom. Second, calculate the present value of the increment in nominal income using a (nominal) discount rate of, say, 10 percent. Third, calculate the perpetuity equivalent of this windfall gain, which is just the gain in present value terms multiplied by the interest rate. Fourth, take appropriate action to limit current consumption spending

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<sup>6/</sup> One might argue that the relevant horizon is not infinite, in which case the rule would be an annuity-equivalent consumption level where the maturity of the annuity is equal to the chosen planning or welfare-analysis horizon. When the discount is in the 10-12 percent range, the distinction between a perpetuity rule and an annuity is likely to be small unless one considers very short horizons.

by the government and the private sector to these sustainable levels. Instruments for doing this are discussed below. If consumption spending is allowed to rise above this level, the cost will be reduced consumption in future periods.

The rule of thumb implies that roughly 90 percent of the additional income from a temporary boom should be saved -- much higher than the actual increase in saving achieved by most countries in practice. The purpose of the above calculations is to stress this aspect of export boom management.

The discussion above refers to countries that are not credit constrained in international markets.<sup>7/</sup> The perpetuity rule for consumption expenditure is only slightly modified if domestic firms are subject to borrowing constraints but households are not credit constrained, or if the country faces limited access to the international credit markets. What is relevant is not the existence of limits on international credit availability but the extent to which they are relaxed as a result of the boom. Endogenous changes in domestic interest rates (if they are market-determined rather than administered) will also affect the simple perpetuity rule to the extent that intertemporal substitution effects in consumption are important -- a point of contention even in industrial countries where more research on the issue has been carried out.

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<sup>7/</sup> One might reasonably ask: for how many countries is this relevant today? After lengthy negotiations with foreign commercial banks, Colombia received a \$1 billion jumbo loan in December 1985. In July 1987, an additional \$1.06 billion commercial bank loan was arranged. (Wall Street Journal, July 21, 1987, p.28). The prolonged nature of these discussions with the commercial banks implies the Colombia should probably be characterized as moderately credit restrained at present. In contrast, many of the African coffee exporters have been severely credit constrained during the mid 1980s.

### The Distribution of Boom Income and its Effect on Spending

As application of the perpetuity rule -- or in many cases even casual empiricism -- readily indicates, excessive increases in domestic consumption following commodity export booms are common. The relative contribution of the private and public sectors to this overspending must be assessed before appropriate policies can be devised. It varies from country to country and is undoubtedly affected by the distribution of the windfall gains between the private and public sectors. The distribution of the windfall gain depends, in turn, on: (i) the domestic tax system, including the existence of export taxes, any surcharges during booms, and the buoyancy of other taxes as domestic inflation and/or national income rise, and (ii) domestic pricing policy. The latter may keep producer prices considerably below world prices; it may also provide significant subsidies to domestic consumers.<sup>8/</sup>

Often the government or the public sector at large is the primary source of overspending; government spending is quick to respond to increased revenue during the boom, but extremely difficult to cut back once the boom subsidies. In the presence of this "ratchet effect," any tendency by the public sector to overspend is exacerbated by taxation policies that redistribute windfall gains towards the government and away from the private sector. In short, the merits of countercyclical changes in commodity export taxes depend critically on whether the government sector's marginal propensity to spend on current consumption is less than the private sector's marginal

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<sup>8/</sup> This discussion presumes that the booming sector is privately, not publicly, owned. While this is the case for Columbia's coffee sector, a boom in the oil sector would have a very different distribution of windfall gains because the resources are owned and extracted by a government entity (with participation by foreign multinationals).

propensity to consume. Of course, higher taxes also reduce production incentives. Whether this is desirable depends on the direction of the bias caused by other distortions that impact private supply, e.g. subsidized inputs such as fertilizer in the agricultural sector. many LDCs have policies that discriminate strongly against the agricultural sector.<sup>9/</sup> However, marketing agreements at the national and international levels may work in the other direction: by supporting domestic producer prices, they artificially stimulating production. This has certainly been the case for the International Coffee Agreement and coffee production in Colombia, whose inventories of unsalable coffee (because of export quotas under the ICA) reached 100 percent of annual production in 1983-4.

If the government sector is the primary contributor to overconsumption during and following booms, the needed policy response must focus on tighter control of public expenditure. In practice, improvement in fiscal control may be more difficult to achieve if the boom-induced increases in tax revenue are large.<sup>10/</sup> This suggests that temporary export surcharges during booms (or equivalently a widening gap between world prices and the prices passed on to domestic producers through commodity stabilization boards) are ill-advised unless there is reasonable confidence that the government will generate the needed increase in fiscal saving by restraining expenditure.

If the private sector (including the booming sector) is also contributing to overconsumption, the role of the government policy becomes more complex. The appropriate role depends crucially on why private overconsumption is occurring. Deviations from the degree of consumption

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<sup>9/</sup> See the World Development Report 1986.

smoothing implied by the permanent income theory may be due to myopia (i.e. the lack of rational expectations) or poor information regarding expected world commodity prices and future incomes, or domestic pricing policies that distort growers consumption and investment decisions. These imperfections, which cause the private-sector response to the boom to be suboptimal, are viewed by some governments as justification for policy intervention to smooth private consumption, i.e. for countercyclical stabilization policies. Noninterventionists, on the other hand, would prefer to improve the dissemination and processing of information by the private sector, and other reforms to improve the functioning of the market mechanism.

The highly idealized situation where either countercyclical stabilization policy as well as institutional and structural reform become unnecessary because the private sector responds efficiently is scarcely approximated in most developing countries. These countries have a wide range of policies -- some of them highly distortionary -- that affect the producer incentives and incomes, including export taxes, domestic stabilization funds and marketing boards, international commodity export agreements, subsidized inputs (such as fertilizer and imported capital equipment) and preferential credit arrangements. <sup>11/</sup> Furthermore, imperfect credit markets place severe restrictions on the feasibility of borrowing against highly uncertain future income. The domestic financial system also fails, in many cases, to allocate loanable funds to the investments where true economic returns are greatest.

The presence of relatively primitive financial markets is an important reason why private consumption increases sharply during booms and falls more

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<sup>11/</sup> A detailed discussion and critique of these institutional arrangements affecting agriculture can be found in the World Development Report 1986. See especially Chapters 4 and 5.

during cyclical downturns than the permanent income theory would predict. It may also distort the allocation of any increased saving that does, in fact, occur. For example, the limited menu of financial assets may cause income recipients in the booming sector to overlook many high-return investments in the rest of the economy when investing their windfalls. As a result, they may overinvest in the booming sector. This tendency can, of course, be greatly exacerbated if domestic producer prices are kept artificially high by government policy. In this situation, both the inefficiency of investment (if it goes into the booming sector rather than superior investments elsewhere) and the distortions to private consumption (caused by inadequate access to consumption loans) reduce the gain in welfare from export booms. Financial reform pays high dividends in such economies by increasing their capability to intermedate the increased saving during booms and facilitating borrowing to smooth consumption during busts. In short, a well-functioning financial system increases the flexibility and resilience of the economy, and hence its ability to cope with commodity booms and busts -- without the need for ad hoc intervention. Hence, long-run financial development is particularly important in countries experiencing periodic commodity market booms and busts.

Even with a reasonably sophisticated financial system in place, traditional countercyclical stabilization measures by the monetary and fiscal authorities will typically be necessary if the potential gains from the export boom are to be maximized. Monetary policy will be discussed below. Returning for the moment to fiscal measures, one might contemplate cyclical reductions in public expenditures and/or increases in revenues via higher export taxes, for example.

### Producer Prices and Commodity Stabilization Funds

It is common for policy makers to adjust the ratio of the producer price to the world price downward during boom periods and to raise it somewhat during slumps by levying a surcharge on booming-sector exports during booms.

12/ The measure may be viewed as a revenue-raising expedient or a countercyclical stabilization device, although it also affects long-run producer incentives. The efficacy of an export surcharge as a countercyclical stabilization device depends, as emphasized above, on the government's marginal propensity to spend out of increased export (tax) revenue being less than that of private producers in the booming sector. If the government saves the bulk of the additional revenues, thereby reducing its fiscal deficit, the effect on aggregate demand will be stabilizing. By using the surplus to reduce its net credit from the central bank, the government can also reduce the monetary impact of the export boom. (The monetary impact of booms is taken up below.) On the other hand, if the additional export tax revenue leads to large increases in government consumption spending, as it so often does in booming economies, the export surcharge may be counterproductive from a macroeconomic stabilization standpoint.

In general, the adverse effect of export surcharge on producer incentives cannot be ignored. By taxing away a portion of the export revenue in good years, the government reduces the expected return from boom-sector

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12/ See Bevan, Collier, and Gunning (1986) for an interesting study comparing the effects of the 1976-78 coffee boom in Kenya and Tanzania. As the authors emphasize, "Kenya passed the price increase on to coffee growers, imposing a coffee tax only after the boom was already over and then only at a very low rate. In Tanzania coffee was taxed so heavily that coffee growers experienced only a minor terms of trade gain, most of the boom income accruing directly to the government." (Chapter 8, p. 457).

production unless, of course, producers are confident that the government will supplement their income by an equivalent amount (via price support programs, for example) during slumps. The credibility of such a price stabilization policy is likely to be much greater, however, if it is implemented by a commodity stabilization fund that is privately controlled or at least separate and distinct from the government budget process. <sup>13/</sup> As long as growers believe that the government's countercyclical export tax-and-subsidy scheme is a positive generator of government revenue over the commodity cycle, their incentive to produce boom-sector output decreases.

In sum, although both price stabilization funds and export surcharges keep domestic producer prices below world prices during booms, surcharges often redistribute income away from producers towards the public sector. <sup>14/</sup> Private stabilization funds can, in principle, retain the windfall gains for producers while at the same time inducing the coffee sector, via the fund, to save during booms.

#### The Allocation of Increased Saving

The next issue involves the allocation of the additional national saving that should be generated during booms. The options available to policy makers will depend on the initial distribution of the windfall among the private sector, commodity marketing boards, and the government, as well as the efficacy of the financial system in intermediating between sectors that have net saving and those that do not.

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<sup>13/</sup> Colombian experience suggests that autonomy of national stabilization funds is extremely difficult to achieve in practice, even if the entity is owned and controlled by the growers themselves.

<sup>14/</sup> Tanzania's experience during the 1976-78 coffee boom provides an excellent example of large redistribution towards the public sector that resulted in a surge in public spending.



The decision of how to allocate these savings should be guided by the principle that the interest rate on foreign borrowing represents the appropriate opportunity cost. <sup>15/</sup> A higher rate is appropriate in the presence of a foreign borrowing constraint. It is essential that appropriate opportunity cost calculations and benefit/cost techniques be employed when choosing among alternative uses of domestic savings or foreign resources. During booms, countries' cost of external borrowing may drop temporarily. Care should be taken to insure that investment decisions are not based on the assumption that the cost of capital will remain low for the duration of long-gestation investment projects. It is more prudent to assume that the cost of borrowing will return gradually to its historic norm as the boom subsides.

Several uses of the additional saving should be considered, with the allocation of saving being dictated by their relative rates of return:

- (i) Pay any arrears on foreign debt service. This use of foreign exchange will generally have the highest return because of the large premium typically charged on imports by countries in arrears.
- (ii) Increase official reserves.
- (iii) The government, public enterprises and/or private firms can be encouraged to reduce their foreign borrowing and to accelerate the repayment of existing external debt.
- (iv) Public enterprises, commodity stabilization funds, and/or private firms and households can be permitted and encouraged to increase their holdings of foreign assets during booms.
- (v) Domestic capital investment (and associated repair and maintenance) expenditures can be increased.

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<sup>15/</sup> To this should be added a risk premium that varies positively with the riskiness of the investment.

- (vi) Trade, financial, and exchange rate reforms that would have been infeasible were foreign exchange less plentiful can be initiated or accelerated.

### Foreign Reserve Accumulation and Debt Management

The accumulation of official reserves tends to occur virtually automatically during booms in most developing countries. This tendency is strengthened by regulations that require all exporters to convert their foreign exchange earnings into domestic currency within, say, three months of receipt. The massive inflow of foreign exchange has important implications for domestic monetary control and inflation. These are discussed in detail below.

For the moment, consider the question of whether the increased inflow of official reserves should be used to repay external debt. Because the bulk of the external debt in most LDCs was in fact incurred by the public sector (or is public guaranteed), this is a central public finance issue. At the most basic level, it seems senseless to have debt outstanding while, at the same time, accumulating foreign reserves, if the cost of borrowing exceeds the interest rate on reserves (roughly the U.S. T-bill rate).<sup>16/</sup> There are, however, several qualifications to this point, which are of practical importance. First, the demand for liquidity (i.e. foreign reserves) to facilitate or expand trade transactions may reflect a high rate of return. In short, the interest rate earned on foreign reserves may understate their marginal social product. Second, on concessional debt, the cost of borrowing may be below rather than above the interest rate paid on reserves. In this case, it makes good economic sense to take the implicit subsidy by increasing

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<sup>16/</sup> Table 2 above shows that this is, in fact, what happened in Nigeria during the 1970s.

holdings of relatively high-yield foreign reserves, rather than accelerating repayment of concessional debt. This assumes, perhaps unrealistically, that the existence of ample foreign reserves does not make it impossible for the authorities to resist political pressures to increase public expenditures. Third, in a world where additional borrowing involves certain fixed costs (such as management, syndication, and other front-end fees) in addition to the periodic interest payments, it is costly to repay existing loans today if the country is going to have to turn around and borrow more soon after the boom has subsided. The strength of this point is enhanced by the fact that the cost of borrowing may be higher after the boom subsides and creditworthiness is re-evaluated.

#### Foreign Asset Accumulation

Capital controls, which prohibit or place severe limits on the acquisition of foreign assets by domestic residents, frustrate the objective of increasing the saving of the economy as a whole during booms.<sup>17/</sup> If the private sector is prevented from accumulating foreign assets, the burden on the public sector to raise its saving is increased. Furthermore, the foreign regulation that requires all exporters to convert export earnings into local currency within a specified period exacerbates the monetary impact of the boom. Even with capital controls in place, which reduces international capital mobility thereby enhancing monetary autonomy, sterilizing this monetary impact is a difficult task.

Responding to the suggestion that domestic residents be encouraged to increase foreign asset holdings during booms, one Nigerian asked, "Why should

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<sup>17/</sup> On the management of booms in the presence of capital controls, see Appendix A and Cuddington (1987).

a poor country like Nigeria lend money to a rich country like the United States?" The answer is clear, failure to do so is likely to lead to massive overspending, and a reduction in Nigerian welfare. Students of the Nigerian oil boom agree that overspending, both for high consumption and "white elephant" investments, was, in fact, a very real problem. The marginal return on investment abroad was higher than that realized in Nigeria.

In spite of the extra burden that capital controls put on the public sector to increase saving, many developing countries are reluctant to abolish them, fearing that "capital flight" may result. Such capital flight would represent a significant erosion of the government's tax base, necessitating higher levels of foreign borrowing or increased reliance on the inflation tax. Indeed, capital controls can only be relaxed if the domestic financial system is not severely distorted by regulated interest rates, high reserve requirements, and inflation. After adequate development of the domestic financial system, as well as substantial liberalization of trade in goods and services, restrictions on private capital account transactions should be relaxed. This will often necessitate a realignment of the exchange rate to maintain or restore equilibrium between the supply and demand for foreign exchange.

An initial, modest step in the direction of reducing restrictions on capital outflows, without risking large-scale capital flight, would be to extend gradually the period that exporters can hold foreign exchange proceeds before converting them to the domestic currency. This approach has been used in Colombia as well as other LDCs during booms, although the holding period has been reduced again once the boom subsides and foreign exchange inflows dwindle.

A second mechanism that is occasionally proposed is for the government or the central bank to sell dollar-denominated securities, e.g. the so-called "coffee bonds" in the Colombian context, either to private coffee exporters or the coffee marketing board. <sup>18/</sup> The Colombian central bank issued such bonds in exchange for dollar reserves during the 1976-80 coffee boom and the 1985-86 mini-boom. This action both contributed to national saving and sterilized the foreign exchange inflows, thereby reducing the inflationary impact of the booms. The consequences would have been quite different had the government rather than the central bank issued the coffee bonds. First, sterilization would not have occurred automatically. Second, although it transfers the bondholders' saving to the government, national saving will not rise unless the government increases its fiscal saving correspondingly. Otherwise, private saving merely finances public dissaving. If the private sector is prohibited from increasing its holdings of foreign assets, the public sector must do so if the desired increase in national saving is to be realized. The only other alternative would be to try to absorb the entire increase in national saving domestically in the form of higher capital investment. This is inadvisable, at least in the short run, for reasons discussed below.

The attractiveness of acquiring foreign assets depends on expected changes in the exchange rate, among other things. Typically, during a boom, a real appreciation of the domestic currency will occur as higher spending on nontradeable goods drives up their relative price in terms of tradeable goods. As the boom subsides, the equilibrium real exchange rate should

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<sup>18/</sup> Allowing these bonds to trade in an active secondary market would facilitate financial intermediation of the boom income.

return gradually to its pre-boom level, assuming no exchange market disequilibrium to being with. These equilibrating exchange rate movements, affect the relative attractiveness of foreign as opposed to domestic assets. As the domestic currency temporarily appreciates and market participants expect this movement to subsequently be reversed, foreign assets become more attractive. This, of course, helps to induce the optimum savings response to the boom. Problems can arise in allocating savings efficiently, however, if:

- (i) disequilibrium exchanges prevail at the onset of a boom,
- (ii) the fiscal authorities adopt expansionary spending policies that make the subsequent depreciation of the domestic currency at the end of the boom highly unlikely or,
- (iii) the foreign borrowing strategy is overly aggressive, which would produce large capital inflows and excessive real appreciation of the currency during the boom.

All of these factors do not affect the incentives to accumulate foreign assets in the same way. But they do indicate the possibility of a non-optimal acquisition of foreign assets during booms if capital controls were to be removed leaving unfettered private incentives to dictate the allocation of the windfall savings across domestic and foreign assets.

#### Domestic Capital Investment

Investment should be undertaken only to the extent (and at a rate) that is economic when evaluated at the country's international borrowing rate. If the country faces credit rationing in the world markets, an even higher discount rate should be used to reflect the true opportunity cost of funds. <sup>19/</sup> In addition to this simple rule of thumb, which ensures the

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<sup>19/</sup> If loanable funds are allocated domestically by market-determined interest rates, even though the country faces a foreign borrowing constraint, the domestic interest rate would be a good indicator of the appropriate discount rate for domestic investment decisions.

optimal allocation of loanable funds and choice of capital investments, there are important issues of timing, domestic and foreign content, and sectoral allocation. To the extent that capital investment uses domestic resources, not just imported goods, it adds to aggregate demand and, depending on capacity utilization, inflationary pressure. For this reason, it may be advisable to postpone investment projects that have a high domestic resource component until the export boom begins to subside. Highly profitable investments with a large import content, on the other hand, might be accelerated because they increase the derived demand for foreign exchange at a time when the central bank may be having difficulty sterilizing reserve inflows. In short, the timing as well as the economic profitability of investment must be considered when managing temporary export booms.

A related concern when contemplating large capital investment expansion is the economy's -- and especially the public sector's -- absorptive capacity for new investment. Attempts to increase the rate of investment too quickly during booms can result in a severe deterioration in the quality of planning, project appraisal, and implementation that is essential if the benefits of higher investment are to be realized. Excessive expansion in public investment or "development" projects has been a widespread problem in countries that experienced booms in the 1970s. Mexico and Nigeria, oil exporters, are notable examples of countries that experienced uncontrolled growth in public investment after the 1973-74 and 1978-79 oil price hikes.

Regarding the sectoral allocation of domestic investment, unwarranted expansion of the booming sector (at the expense of other exportables, and import substitutes) is a common problem. If windfall gains accrue largely to producers in the booming sector, i.e. they are not taxed away by the

government, policies must be designed to facilitate the intermediation of these savings. Otherwise, there may be overinvestment in the sector, relative to the level that long-term trends in the world export markets would justify. (Recall the case of forced investment in coffee inventories by Colombia's National Coffee Fund.) If the financial system is not sufficiently well developed to carry out this task, it may be necessary in the short run, at least, to use the tax system coupled with transfer payments or government loans to reallocate the windfall towards high-productivity investments. Limiting the extent to which world prices are passed through in the form of higher domestic producer prices will also help to prevent overexpansion of the booming sector. (See the discussion of producer prices and commodity stabilization funds above.)

Many countries find that the value of their currency, as measured by the real effective exchange rate, appreciates sharply during booms. This appreciation can easily prove excessive, however, either due to the monetary and inflationary impact of the export revenue surge <sup>20/</sup> (and a failure to adjust the nominal exchange rate to compensate for higher domestic inflation) or because of overspending by the public or private sectors. Excessive appreciation can bias investment towards the nontradeables at the expense of non-booming-sector tradeables production. Particularly if the government has a policy of trying to diversify and expand domestic production of tradeable goods (by eliminating existing distortions against production in sectors with strong export potential), it may wish to undertake investment in non-traditional export industries using the windfall gain from the booming export

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<sup>20/</sup> See Sebastian Edwards (1985) on real exchange rate overshooting caused by the monetary impact of export booms.



sector. The task of "picking winners" among potential export sectors is a difficult one, however. A strong case can be made that it is best left to the private sector. It may be desirable to allocate some public investment funds obtained during the boom to large-scale export-oriented projects, as Colombia did in its oil, coal, and nickel sectors during the 1976-80 coffee boom. The case for doing so is strengthened in situations where the private capital market is too small or insufficiently developed to allow the private sector to finance such investments. <sup>21/</sup>

#### Monetary Aspects of Coffee Booms

Almost without exception, commodity export booms in developing countries have been accompanied by a surge in domestic inflation rates relative to those prevailing abroad. <sup>22/</sup> In fact, it is often argued that a surge in the domestic inflation rate is an inevitable consequence of the large foreign exchange inflows that accompany export booms. This is not the case. First, allowing increased imports will reduce inflationary pressure by increasing the demand for the additional foreign exchange being received by the central bank. Second, mechanisms exist for sterilizing at least part of the foreign reserve inflows, even in countries with only rudimentary financial markets. The potential for sterilization is greatly enhanced if the government can generate fiscal surpluses; this enables it to repay domestic credit from central bank, thereby offsetting the expansion of the monetary base caused by foreign exchange inflows. Increased fiscal saving is, of course, what

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<sup>21/</sup> The large financing requirements may also justify foreign direct investment in such sectors. Colombia's experience with joint venture projects with foreign firms is noteworthy here.

<sup>22/</sup> See Cuddington (1986) on Colombia and Rajaram (1985) on Sub-Saharan Africa for empirical evidence.

optimal policy dictates during booms. As we discussed above, inflationary pressure is caused not only by the export boom itself, but by the uncontrolled expansion in government expenditure and domestic credit creation to finance the resulting fiscal deficits that accompany, and outlive, the boom. <sup>23/</sup> If sterilization is unfeasible (or not attempted) under managed exchange rates, then there is a presumption that the money supply will increase by several times the amount of the foreign reserve inflow, due to the standard money multiplier process. <sup>24/</sup> This problem is exacerbated in many developing countries where foreign exchange regulations require exporters to convert all export proceeds into the local currency within several months of receipt. Because none of the boom revenue can (legally) be held in the form of foreign assets, it is completely monetized unless the monetary authority can take offsetting action. (See Appendix A.)

To assess the inflationary pressure caused by the boom, the aforementioned increase in money supply must be compared to the anticipated increase in money demand. The derived demand for transactions balances should be larger for permanent booms than for temporary or cyclical shifts in

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<sup>23/</sup> In the literature on the monetary aspects of the Dutch Disease, there is some disagreement as to whether export booms will have an inflationary or deflationary effect. In short, the argument is over whether the boom-induced increases in money demand will exceed or fall short of the boom-induced increases in money supply. Under flexible exchange rates and free capital mobility, there will be no endogenous change in the money supply unless the monetary authority elects to be "accommodative." Hence, because the boom raises money demand, it is deflationary. This is the situation discussed, for example, by Neary and van Wijnbergen (1984) with reference to the British or other developed country variant of the Dutch Disease. The discussion in the text focusses on the money supply aspects in countries that have managed (rather than floating) exchange rate regimes.

<sup>24/</sup> See Robert E. Cumby and Maurice Obstfeld (1983) for an interesting study of sterilization in Mexico. They find that the Mexican monetary authority was able to sterilize virtually all of the foreign reserve inflows during the second half of the 1970s.

income, because the latter imply smaller increases in expenditure. During temporary booms, money demand will typically increase by considerably less than money supply, causing considerable inflationary pressure. Unless the monetary authority continues to adjust the nominal exchange rate to reflect the differential between the domestic and world inflation rates, there will be a sharp increase in the real effective exchange rate and, hence, an adverse effect on the international competitiveness of non-coffee exports.

In countries with reasonably deep secondary markets for government securities, contractionary open market operations can be used to offset or "sterilize" the increase in the monetary base caused by foreign exchange purchases by the central bank. In many LDCs, open market operations are precluded by the absence of such securities markets. Nevertheless, a number of other mechanisms can be used to control the rate of monetary expansion during boom periods. One often-used sterilization method is to increase the marginal reserve requirements that commercial banks must hold against their deposit liabilities. Although this policy response reduces the monetary consequences of the boom, it amounts to a tax on the banking system, thereby reducing the efficiency of financial intermediation by widening the gap between borrowing and lending rates of interest. These effects reduce the incentive to save during the very periods when efforts to increase saving are particularly important. <sup>25/</sup>

Preferable mechanisms for sterilizing foreign exchange inflows reduce the flow-through from foreign reserves to the monetary base directly, rather than attempting to sever the link between the monetary base and the broader

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<sup>25/</sup> To the extent that increased reserve requirements indirectly encourage new types of financial intermediation, the adverse effects on saving will be mitigated.

aggregates (as increasing reserve requirements does). Even in the absence of open market operations this is still feasible in many LDCs. During the 1985-86 mini-boom, for example, the Colombian monetary authority sold non-monetary liabilities to the commercial banks in order to reduce the increase in high-powered money. The net effect of this action on the money supply is the same as that of an open market operation. A related sterilization mechanism would be to sell "coffee bonds" to private coffee producers or the coffee marketing board, thereby reducing the increase in domestic liquidity.

## VI. CONCLUSIONS

Fiscal policy in commodity-exporting countries differs in at least two ways from fiscal policy in other LDCs. First, government revenues tend to be highly dependent on fluctuations in primary export earnings. This is true when export taxes form a large component of the total tax base, but it also arises when most of the windfall gain from booms accrues initially to the private sector, as the example of Kenya during the 1976-78 coffee boom illustrates. The problem of developing and maintaining a diverse tax base is particularly acute in such economies. Second, surges in government revenues tend to be accompanied by sharp increases in government spending, which are difficult to reverse when the boom ends. As a result booms often lead to large fiscal deficits, rather than surpluses. This lack of expenditure control is perhaps the key fiscal problem in most commodity exporting countries. Associated with it are overvalued exchange rates, sectoral distortions in resource allocation, and monetary and financial disequilibria necessitated by fiscal deficit finance. Consequently, countries with macro mismanagement have often found themselves worse off after the booms subsided than before they occurred: economic distortions have been exacerbated and policy flexibility has been reduced. On the other hand, countries whose fiscal management during booms has been relatively conservative, such as Cameroon (during the coffee and petroleum booms of the 1970s) and Colombia (during the coffee mini-boom of 1985-86), have generally benefitted from booms. Clearly, good fiscal control during periodic boom episodes enables these booms to temporarily accelerate the rate of economic development.

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## APPENDIX A

### THE IMPACT OF CAPITAL CONTROLS ON THE MANAGEMENT OF EXPORT BOOMS

Foreign exchange controls on current account and capital account transactions not only have monetary controls implications. In many countries they are an important fiscal instrument of the government. [Dornbusch has emphasized that a multiple exchange rate system can be mimicked by a uniform exchange rate combined with a set of taxes and subsidies on various trade and international financial transactions.] The presence of foreign exchange controls also affects the macroeconomic management of periodic export booms.

If one assumes that commodity export booms are temporary phenomena or that commodity prices are very uncertain (so that this uncertainty is more important than any attempt to decompose price movements into permanent and temporary components), booms should be accompanied by large increases in national saving. The extent to which this additional saving should ultimately be invested domestically as opposed to abroad depends critically on whether controls on capital inflows and outflows are binding before the export boom. For reasons given in the text, it is extremely unlikely that the entire amount of the additional saving generated during booms can be efficiently absorbed by domestic capital investment, at least in the short run. Hence, the optimal strategy for the country as a whole involves increasing considerably its net foreign assets.

Foreign exchange controls are relevant here because they limit the extent and the mechanisms through which the economy can acquire foreign assets. By segmenting the domestic financial market from the world market, at least to some extent, capital controls cause domestic interest rates to respond to boom-induced increases in national saving in a way that is quite different from their response in the absence of controls, where domestic interest rates would remain equal to the prevailing rates in the world financial markets plus the rate of expected depreciation of the peso. Induced changes in interest rates, in turn, affect domestic demand for money and non-monetary assets and, hence, the inflationary impact of the boom.

The direction of domestic real interest rate movements will depend critically on the nature of the foreign exchange controls and the central bank's response to the foreign exchange inflow from export proceeds.

When foreign exchange regulations require that all export proceeds be converted into local currency, the huge increase in the domestic monetary base that results can cause difficult monetary controls problems for the central bank. It is sometimes argued that inflation is an unavoidable consequence of temporary export booms. This is not entirely true. It is argued here that inflation is at least in part the consequence of the foreign exchange controls system. The availability of various central bank mechanisms for sterilizing the impact of foreign reserve inflows on the

domestic money supply also plays a role. <sup>26/</sup> One such mechanism is to increase marginal reserve requirements. This policy tool may be interpreted as a fiscal instrument; it is, in effect, an increase in the tax on financial intermediaries. Although it may facilitate sterilization and the finance of fiscal deficits while reducing its inflationary consequences, the higher tax on saving and investment during booms has counterproductive incentive effects.

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<sup>26/</sup> Colombia's experience in this regard is interesting because of the role that the National Coffee Fund has played in the sterilization process. Nevertheless, complete sterilization of the monetary impact of the boom has remained an elusive goal, with the monetary aggregates growing considerably more rapidly than the boom-induced growth in money demand in the 1976-79 period. This caused inflation to surge and real interest rates to fall sharply to large negative values in 1976-77. These developments presumably reduce much-needed increments to saving, while at the same time inducing excessive domestic investment expenditures.

## APPENDIX B

### MACRO EFFECTS OF THE 1976-80 COFFEE EXPORT BOOM IN COLOMBIA<sup>27/</sup>

The 1976-80 boom, reflected in the price data in Table 1, caused a sharp improvement in the country's current account position, moving it from a modest deficit of 2.8 percent of GDP in 1974 to a surplus that peaked at 2.3 percent of GDP in 1977. GDP growth surged, but only fleetingly, above its post-war average, growing at 8.5 percent in 1978. More importantly, however, the coffee export boom caused a massive build-up in foreign exchange reserves. This foreign reserve inflow was accentuated -- relative to what might have been expected in a countries like Great Britain or the Netherlands during their energy booms -- by foreign exchange regulations requiring that coffee exporters convert all foreign exchange earnings into domestic currency. Trade restrictions that limit the demand for foreign exchange were relaxed only gradually. Hence, although the volume of imports increased somewhat, the resulting increase in foreign exchange demand was small relative to the inflow from the coffee bonanza. As a result, the country's reserves, excluding gold, rose more than tenfold from US\$475 million in 1976 to US\$4,831 million in 1980.

The large increase in the foreign reserves of the Colombian monetary authority raises a number of questions. First, what was the monetary impact of the foreign reserve inflow caused by the boom? Did it lead to a rapid expansion in the domestic money supply, or did the authorities succeed in "sterilizing" its effect? What role did or could fiscal policy play in this sterilization process? Second, what happened to the domestic inflation rate (relative to prevailing world levels) during the boom? Was inflation primarily a "monetary phenomenon" during this episode? In particular, is there any evidence of a growing imbalance between the growth in money demand, which occurs as national income rises during a boom, and the growth in money supply (caused either by unsterilized foreign reserve inflows or increases in domestic credit creation)? Third, did the foreign exchange market intervention keep the real effective exchange rate from becoming seriously over- or undervalued?

#### A. Inflation and the Real Exchange Rate

In order to answer these questions, we begin by examining the movements in Colombia's inflation rate and real exchange rate. During the 1976-80 boom, the country experienced a temporary surge in its inflation rate relative to the rates prevailing in the rest of the world. As Table 2 shows, Colombian inflation as measured by the consumer price index (CPI) registered 33.1 percent in 1977, the year when coffee prices peaked. In contrast, world inflation was only 11.3 percent that year.<sup>28/</sup> The inflation differential

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<sup>27/</sup> This appendix is material taken from Cuddington (1986, Section IV).

<sup>28/</sup> The measure of world inflation used here is from the IMF's International Financial Statistics, line 64x.

1-24-86, FILE NAME : TAB1

TABLE 1  
PRICES, TERMS OF TRADE, AND THE REAL EFFECTIVE EXCHANGE RATE

END OF YEAR	EXPORT COFFEE PRICES 1/ (US DOLLARS)	EXTERNAL TERMS OF TRADE 2/	REAL EFFECTIVE EXCHANGE RATE TERMS OF TRADE WEIGHTED AVERAGE 3/	COLOMBIAN REAL EXCHANGE RATE 4/
1970	32	75.0	91.1	59.1
1971	27	70.2	96.0	60.8
1972	31	73.7	100.7	61.0
1973	41	78.4	101.7	57.9
1974	44	81.8	100.6	56.9
1975	46	75.7	118.6	60.1
1976	88	106.3	116.7	59.3
1977	134	147.6	101.3	50.3
1978	104	110.0	103.4	48.8
1979	103	98.4	101.4	47.5
1980	100	100.0	100.0	47.3
1981	72	84.4	93.0	47.2
1982	78	81.8	87.4	47.3
1983	74	83.9	89.7	50.1
1984	81	86.8	95.4	57.6

1/-Obtained from IFS line 76e.d. Index is in US Dollars.

2/-Obtained by dividing the u.s. dollar export prices index to the u.s. dollar import prices index (multiplied by

3/-Obtained from Ms. Chiari, IMF (X-57548). Increases in the index indicate real depreciation of the Colombia pes

4/-RER=(pesos per us dollar (period average) \* U.S.consumer price) / Colombian consumer price.

TABLE 2

YEAR	COLOMBIAN CPI INFLATION RATE 1/	WORLD CPI INFLATION RATE 1/	US CPI INFLATION RATE 1/	WORLD INFLATION DIFERENTIAL	US INFLATION DIFERENTIAL
1971	9.0	5.6	4.3	3.4	4.7
1972	13.4	5.3	3.3	8.1	10.1
1973	20.8	9.0	6.2	11.8	14.6
1974	24.3	15.2	11.0	9.1	13.3
1975	22.9	13.3	9.1	9.6	13.8
1976	20.2	11.1	5.8	9.1	14.4
1977	33.1	11.3	6.5	21.8	26.6
1978	17.8	9.7	7.6	8.1	10.2
1979	24.7	12.5	11.3	12.2	13.4
1980	26.5	15.0	13.5	10.7	13.0
1981	27.5	14.1	10.4	13.4	17.1
1982	24.5	12.3	6.2	12.2	18.3
1983	19.8	12.6	3.2	7.2	16.6
1984	16.1	14.1	4.3	2.0	11.8

1/-IFS, LINE 64..1.

vis-a-vis the US CPI deteriorated even more, as the Table shows. Thus, there was a clear tendency for the inflation differential vis-a-vis the rest of the world to widen during the boom years. This experience, by the way, is by no means unique to Colombia; it also occurred in other countries that had commodity export booms during the 1970s. (See Davis, 1983, for a discussion.)

As the last two columns in Table 1 imply, the rise in the inflation differential (either against the US or the world as a whole) was not matched by an equal increase in the rate of crawl of the Colombian peso. Consequently, a sharp appreciation of the real exchange rate occurred. The trade-weighted real effective exchange rate index appreciated more than 30 percent from 118.6 in 1975 to 87.4 in 1982, when the monetary authority belatedly began to engineer a real depreciation of the peso. This real exchange rate appreciation, and the strong real wage increases that accompanied the boom, drastically reduced the international competitiveness of non-coffee exports.

These factors evidently more than offset the slow progress on the trade liberalization front during this period, because the growth rate of non-coffee exports slowed significantly. Hence, Colombia experienced the sort of slowdown in its non-booming tradeables sector discussed in the Dutch Disease literature. The ratio of non-coffee exports plummeted from 10.7 percent of GDP in 1976 to 6.6 percent in 1983, roughly the same share they had held in the mid-1960s before the export diversification drive began. In short, the slow, but steady, progress in diversifying the country's export base between 1967 and 1974 was completely reversed during the coffee boom period.

It is now widely recognized that the overvaluation of the exchange rate that developed during the coffee boom caused a major setback in the country's long-standing program of export diversification and contributed to the severity of the economic downturn after the coffee boom ended. From a policy standpoint, therefore, two questions arise:

a. Is inflation an unavoidable consequence of the commodity price boom or can it be prevented by appropriate monetary and fiscal policy action?

b. To the extent that the inflationary surge can not be prevented, would it be advisable to accelerate the rate of crawl of the peso in order to match the inflation differential, thereby preventing the exchange rate from becoming overvalued?

## B. The Monetary Policy Response

This section leaves aside the second question regarding exchange rate policy and focuses on the monetary aspects of the boom. We start with the presumption that inflation is - ultimately, at least -- a monetary phenomenon, i.e. it is caused by monetary growth in excess of the growth in money demand.

It is sometimes claimed that inflation is an unavoidable side-effect of export booms, because the surge in foreign exchange earnings leads to rapid

growth in the foreign exchange reserves of the central bank.<sup>29/</sup> This is especially true when exporters are legally obligated to convert foreign exchange revenue into domestic currency, as is the case in Colombia. The resulting foreign exchange inflow, therefore, necessarily causes an increase in the domestic monetary base. This monetary effect is allegedly difficult to sterilize in the absence of well-developed financial markets that could be used in conducting contractionary open-market operations.<sup>30/</sup>

To examine the validity of this view, we first examine the tightness of the link between foreign exchange inflows and increases in the domestic monetary base. The following questions arise:

- a. To what extent is it possible to sterilize in the absence of open market operations?
- b. What are the mechanics of sterilization in this environment?
- c. To what extent does sterilization depend on the possibility of generating a fiscal surplus?

Although it is often claimed that there is a very tight link between foreign reserve inflows and the monetary base in developing countries (see e.g. the literature on the monetary approach to the balance of payments), this link appears to be very loose in the case of Colombia. As Table 3 shows using data for the 1975-81 period, there is often a significant divergence between the change in the foreign assets of the central bank and changes in the monetary base. Not only are the relative magnitudes of changes in the two time series different, they sometimes even have different signs! In fact, the simple correlation coefficient between the series over the 1951-84 period is slightly negative (-0.094), not positive as the argument above would suggest. Thus, it may, in fact, be possible to sterilize the effect of reserve inflows on the Colombian monetary base.

Even in the absence of a deep, well-developed government bond market, which would permit open market operations as a method of sterilizing foreign reserve inflows, there are a number of other instruments or mechanisms that might be used.<sup>31/</sup> To reduce net credit from the central bank to the

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<sup>29/</sup> This statement implies that the growth in money demand caused by the boom-induced increase in national income typically falls short of the growth in money supply caused by the inflow of foreign exchange earnings.

<sup>30/</sup> This theme dominates in writings on the "monetary approach to the balance of payments." See, e.g., Frenkel and H.G. Johnson (1976).

<sup>31/</sup> Although open market operations were not used much during the 1976-80 boom, changes in reserve requirements being the main monetary policy instrument, they have been used extensively during the current (1986) coffee boom. The market for government securities, however, is still relatively small, and the feasibility of open market operations may be inhibited by interest rate ceilings if interest rates continue to rise.

**TABLE 3**  
**THE IMPACT OF FOREIGN EXCHANGE INFLOWS ON THE MONETARY BASE**  
**BILLIONS OF PESOS**

YEAR	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
CHANGE IN NET FOREIGN ASSETS OF CENTRAL BANK 1	4.32	23.57	27.34	27.75	75.60	79.61	43.43	2.84	-82.71	-81.09
CHANGE IN NET CREDIT TO GOVERNMENT 2/	3.04	-2.92	-1.53	-4.65	-21.99	-9.76	-1.34	56.51	41.29	147.84
CHANGE IN MONETARY BASE 3/	7.65	19.68	21.44	40.15	33.69	43.66	46.78	42.05	52.25	78.47
PERCENTAGE CHANGE IN MONETARY BASE	25.42	41.54	40.13	53.65	29.29	29.36	24.32	17.58	18.58	23.53

SOURCE : IFS DATA BANK.

1/-NET FOREIGN ASSETS = FOREIGN ASSETS - FOREIGN LIABILITIES -LONG-TERM FOREIGN BORROWING (IFS : LINE 11-16C-16CL).

2/-CHANGE IN NET CREDIT = CLAIMS ON GOVERNMENT - GOVERNMENT DEPOSITS (IFS LINE 12A-16B).

3/-CHANGE IN RESERVE MONEY, IFS LINE 14.



government -- which is, in effect, what contractionary open market operations do -- the government can repay loans from the central bank in periods when foreign reserve inflows are large. This repayment could even be financed by borrowing from commercial banks in order to repay government loans from the central bank, although this strategy ultimately crowds out private investment (which may hinder an efficient private-sector response to the boom). Alternatively, the government can reduce its net liabilities from the central bank by running a fiscal surplus and either depositing this surplus in its accounts at the central bank, or repaying loans from the central bank.

The data in Table 3 suggest that a small amount of sterilization did occur in 1976-79. Unfortunately, the reduction in government net credit from the banking system was much too small to offset the massive reserve inflows. Only in 1979, when the 75.6 billion peso increase in net foreign assets of the central bank was accompanied by a 21.99 billion peso drop in net credit to the government, did the reduction in government credit significantly reduce the expansion of the monetary base that would otherwise have occurred. All in all, however, the sterilization of foreign reserve inflows during the boom appears to have been very modest, judging from the fact that changes in government net credit from the central bank provided little offset to the large inflows of foreign exchange. Consequently, the domestic monetary base increased at 42, 40, 54 and 30 percent per annum in 1976-79 respectively. <sup>32/</sup>

One must be particularly careful about viewing the 1979 movements in the central bank's balance sheet as sterilization activity. In that year the public sector undertook a large amount of external borrowing. <sup>33/</sup> At the same time, Table 4 shows that a considerable portion of the reduction in the government's net liabilities to the central bank was due to a large increase in government deposits at the central bank. What was, in fact, occurring was rather slow disbursement of funds for public investment projects being financed by foreign borrowing. In the meantime, the borrowed funds are held as government deposits at the central bank. Although this activity causes foreign reserve inflows to increase and government liabilities net of deposits to the central bank to decrease, this is not reflecting sterilization activity in the usual sense of the term.

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<sup>32/</sup> Another, overlooked, mechanism for sterilizing at least a small part of reserve inflows operates through advance deposit requirements on imports. If a country has such requirements, as Colombia does, then the relaxation of controls to allow more imports into the country will induce an increase in the amount of domestic money that must be put on deposit at the central bank. Assuming the central bank does not act to offset this contractionary effect on the money supply, the net effect of the boom on the money supply will be reduced somewhat. Advance deposits on imports did, in fact, rise during the 1976-80 coffee boom, but the increase was very small relative to the massive inflow of foreign exchange reserves.

<sup>33/</sup> See Cuddington (1985) for a detailed discussion of Colombian external borrowing in the late 1970s and early 1980s.

Nonetheless, it is certainly true that, to the extent that the loans ultimately lead to the purchase of foreign goods -- i.e. greater imports -- the net foreign reserve inflow would be reduced, as would the expansionary effect of the export boom on the monetary base. Indeed, this is one of the reasons why Colombia has tended to relax import restrictions during boom periods: allowing more imports to enter the country reduces the net inflow of foreign reserves, and hence the inflationary effect on the monetary base. This beneficial effect of greater imports, however, has often been reduced by the sluggishness of the trade bureaucracy.

Whether it was feasible to significantly reduce the rate of expansion of the monetary base during commodity export booms by more aggressive sterilization is unclear from the historical evidence.<sup>34/</sup> It does seem reasonable to conclude, however, that the possibility of sterilization will be greatly enhanced if the government can generate a fiscal surplus during boom periods, so that its net credit from the central bank can be greatly reduced.<sup>35/</sup> If the government does not drastically reduce its demand for credit, the only option open to the central bank may be to reduce credit to the private sector, if it wants to maintain control over the monetary base.

Up to this point, we have discussed the feasibility of sterilizing the monetary impact of export booms by offsetting the effect of reserve inflows on the monetary base. Achieving this objective was seen to depend importantly on fiscal policy considerations. The usual presumption is that it is growth in some monetary aggregate, such as M1 or M2, not growth in the monetary base, that is most closely linked to domestic inflation. There is a long, and still unresolved, debate in the industrial country context about which definition of money provides the tightest link between money and inflation. In the Colombian context, however, a number of empirical studies have documented the link between M2 and inflation.

Assuming that it is growth in M2 (or M1) in excess of the growth in real money demand that causes inflation, another instrument is available for reducing the monetary impact of coffee booms, namely, the monetary authority can raise the reserve requirements on commercial bank deposits. From a fiscal policy viewpoint, reserve requirements are a tax on the financial system. From a monetary perspective, the increase in reserve requirements reduces the money multiplier; thus, even if export booms do cause an increase in the monetary base, their effect on broader monetary aggregates will be reduced. This mechanism for sterilizing foreign reserve inflows has been used extensively by the Colombian monetary authorities. As Table 4 shows, the ratio of reserve money (i.e. the monetary base) to M1 rose sharply from .61 in 1974 to .93 in 1981. The reserve money/M2 ratio also increased --

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<sup>34/</sup> The monetary policy developments in 1986 provided strong evidence that sterilization was indeed feasible. The Central Bank has succeeded in sterilizing a large fraction of the surge in coffee export earnings in 1985-86 via open market operations.

<sup>35/</sup> The appropriate fiscal policy response to booms is discussed in more detail below.

TABLE 4  
MONETARY RESPONSE TO THE BOOM

YEAR	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
RESERVE MONEY/M1	0.61	0.61	0.59	0.60	0.61	0.64	0.67	0.72	0.87	0.90	0.91	0.93	0.87	0.84	0.84
RESERVE MONEY/M2	0.53	0.53	0.50	0.49	0.47	0.48	0.51	0.53	0.64	0.67	0.60	0.55	0.53	0.51	0.50
RESERVE MONEY (growth rate)	-	12.1	23.2	31.1	21.3	25.4	41.5	40.1	53.6	29.3	29.4	24.3	17.6	18.6	23.5
M1 (growth rate)	-	11.9	27.1	30.8	17.8	20.1	34.7	30.4	28.4	24.8	28.0	20.7	25.4	23.4	24.1
M2 (growth rate)	-	13.2	29.2	35.0	25.2	23.2	33.9	33.8	27.9	22.8	45.0	35.6	20.9	25.4	23.9
REAL GDP (growth rate)	9.3	6.0	7.7	6.7	5.7	2.3	4.7	4.2	8.5	5.4	4.1	2.3	0.9	1.0	3.0
TOTAL RESERVES MINUS GOLD (MILLIONS \$US) 1/ PERCENTAGE CHANGE	189	188	309	516	431	475	1101	1747	2366	3844	4831	4801	3861	1901	1364
	-	-0.5	64.4	67.0	-16.5	10.2	131.8	58.7	35.4	62.5	25.7	-0.6	-19.6	-50.8	-28.2
CENTRAL BANK SELECTED ASSETS AND LIABILITIES															
NET FOREIGN ASSETS 2/ FOREIGN ASSETS 3/ FOREIGN LIABILITIES 4/ L-TERM FOREIGN BORROWING 5/ CHANGE IN NET ASSETS % CHANGE IN NET ASSETS	1.8 4.0 1.2 1.1 - -	1.8 4.6 1.1 1.6 0.1 3.4	5.2 7.8 0.3 2.3 3.4 186.8	9.4 12.7 0.8 2.5 4.2 80.3	8.0 11.9 1.0 3.0 -1.4 -15.4	12.3 16.7 0.2 4.3 4.3 54.3	35.9 41.0 0.2 5.0 23.6 191.9	63.2 69.9 0.2 6.4 27.3 76.3	90.9 100.4 0.4 9.0 27.8 43.9	166.5 177.9 0.3 11.1 75.6 83.1	246.2 261.5 0.2 15.2 79.6 47.8	291.6 310.6 0.2 18.8 45.4 18.5	294.4 317.9 0.1 23.4 2.8 1.0	211.7 242.6 7.4 23.5 -82.7 -28.1	130.6 169.9 8.3 31.0 -81.1 -38.1
NET CLAIMS ON GOVERNMENT 6/ CLAIMS ON GOVERNMENT 7/ GOVERNMENT DEPOSITS 8/ CHANGE IN NET CLAIMS % CHANGE IN NET CLAIMS	4.0 5.6 1.6 - -	5.5 6.8 1.3 1.6 38.9	5.5 7.0 1.5 -0.1 -1.4	4.6 6.2 1.6 -0.8 -15.4	6.1 8.0 1.9 1.5 31.5	9.1 10.9 1.8 3.0 50.2	6.2 9.0 2.8 -2.9 -32.1	4.7 8.8 4.1 -1.5 -24.8	0.0 9.5 9.5 -4.7 -	-22.0 13.1 31.7 -22.0 -	-31.8 13.7 44.8 -9.8 44.4	-33.1 13.7 46.8 -1.4 4.3	23.4 46.7 23.3 56.5 -170.7	64.7 106.8 42.1 41.3 176.5	212.5 252.3 39.8 147.8 228.5
IMPORT DEPOSITS 9/ % CHANGE IMPORT DEPOSITS	2.4 -	2.1 -10.8	2.5 16.8	3.7 46.4	3.8 4.9	2.0 -48.7	0.1 -95.4	5.1 5566.7	5.9 16.5	10.1 70.7	12.8 25.7	12.0 -5.6	10.0 -17.1	25.6 157.0	35.9 40.3
MONETARY BASE (PESOS) 10/	13.7	15.4	18.9	24.8	30.1	37.8	53.4	74.9	115.0	148.7	192.4	239.2	281.2	333.5	411.9

SOURCES: IFS DATA FILE.

1/-IFS, LINE 11.d, MILLIONS OF US DOLLARS.

2/-NET FOREIGN ASSETS OF CENTRAL BANK = FOREIGN ASSETS - (FOREIGN LIABILITIES + LONG-TERM FOREIGN LIABILITIES).

3/-IFS, LINE 11, BILLIONS OF PESOS.

4/-IFS, LINE 16C, BILLIONS OF PESOS.

5/-IFS, LINE 16CL, BILLIONS OF PESOS.

6/-NET CLAIMS OF CENTRAL BANK ON GOVERNMENT = CLAIMS ON GOVERNMENT - GOVERNMENT DEPOSITS.

7/-IFS, LINE 12A, BILLIONS OF PESOS.

8/-IFS, LINE 16D, BILLIONS OF PESOS.

9/-IFS, LINE 16B, BILLIONS OF PESOS.

10/-IFS, LINE 14, BILLIONS OF PESOS.

**Table 3** COLOMBIA: MARKET INTEREST RATES AND BONOS DE PRENDA RATES, 1970-81

Year	Market Interest <sup>a/</sup>	Rate of Inflation <sup>b/</sup>	Real Market Interest (ex post)	Interest Rate Bonos de Prenda	
				Nominal <sup>c/</sup>	Real (ex post)
1970	13.3	7.2	6.1	10.0	2.8
1971	16.4	12.6	3.8	10.0	- 2.6
1972	15.6	14.1	1.5	10.0	- 4.1
1973	20.3	22.1	- 1.8	10.0	-12.1
1974	30.4	25.2	5.2	15.0	-10.2
1975	23.8	17.5	6.3	17.0	- 0.5
1976	22.4	25.4	- 3.0	17.0	- 8.4
1977	22.9	27.5	- 4.6	17.0	-10.5
1978	25.9	19.7	6.2	17.0	- 2.7
1979	36.5	26.5	10.0	17.0	- 9.5
1980	41.5	24.5	17.0	24.0	- 0.5
1981	52.5	25.6	26.9	28.8	3.2

<sup>a/</sup> CAT, 120 day maturity, average annual rate.

<sup>b/</sup> Consumer price index.

<sup>c/</sup> Average discount rate.

Source: Calculations DNP/UEA/DC based on Banco de la Republica, Resoluciones de la Junta Monetaria, Asobancaria.

*Reproduced from Colombia: External Sector and Agriculture Policies for Adjustment and Growth. The World Bank, Report No. 4331-CO, April 20, 1984, Table 5.3.*

from .47 in 1974 to .67 in 1979 -- as foreign reserve inflows surged. In spite of the fact that the monetary authority introduced marginal reserve requirements of 100 percent in 1977 in an attempt to reduce the monetary impact of the coffee boom, the monetary aggregates, not just the monetary base, grew well in excess of the growth rate of real GDP.

The rapid monetary expansion (relative to GDP growth) initially caused a large drop in real interest rates, but they returned to positive levels by 1979 as the public investment program expanded and inflation remained high by international standards. See Table 5.

In sum, an important macroeconomic effect of the 1976-80 coffee boom was a temporary fall in the real interest rate, which was quickly reversed, and a more enduring inflationary impact. In spite of large increases in reserve requirements imposed on commercial banks, the Colombian monetary authority was apparently unsuccessful in sterilizing the monetary impact of the boom. This conclusion leads immediately to the question: could this monetary impact have been avoided by more aggressive depreciation of the domestic currency, thereby reducing the extent of the real overvaluation that occurred?

#### C. Foreign Reserve Inflows, Exchange Rate Policy, and Capital Controls

The movements of the real effective exchange rate and international reserves over the export cycle are particularly important when discussing the potential impacts and sustainability of trade reform in the Colombian context. As official reserves grow during booms, the likelihood of trade liberalization rises. Conversely, the rapidity with which trade controls are re-tightened as exports turn down depends on the size of the official reserve holdings. In the early 1980s, for example, the country's international reserves were at the unprecedented level of U.S.\$4.8 billion. Hence, imports were allowed to grow rapidly for roughly two years after exports collapsed in 1980. The frightening rate at which reserves were being lost -- they dropped to less than US\$1.4 billion by year-end 1984 -- caused import restrictions to be progressively tightened in 1983-85.

In periods of rapid export growth, foreign exchange reserves have risen sharply as the monetary authority intervened to moderate the appreciation of the peso. This was particularly evident in the 1976-80 boom when the current account moved into a strong surplus position, and was accompanied by an even larger surge in foreign exchange reserves (as the public sector began to borrow heavily in foreign markets, and illegal drug money inflows surged). The purchase of foreign exchange reserves by the Banco de la República caused rapid growth in the monetary base and the money supply, as discussed in the previous sub-section.

The massive accumulation of foreign reserves by the central bank during the 1976-80 boom is reasonably direct evidence that the Colombian peso would have appreciated sharply in nominal terms if the central bank had intervened less in the foreign exchange market. This strategy would have reduced the monetary impact of the export boom, but the real exchange rate would have

appreciated more rapidly. From this perspective the difficult policy trade-off is between greater monetization of foreign reserve inflows and greater exchange rate appreciation.

The foregoing discussion, however, overlooks an important policy option that would reduce the intensity of the policy dilemma. Colombian exporters are forced to convert foreign exchange earnings into pesos within several months of their receipt. Furthermore, Colombian residents at large are not permitted to accumulate foreign assets. In the presence of such foreign exchange controls, the large reserve inflow need not be an indication of an undervalued currency. On the contrary, exporters (not to mention domestic residents in general) who would, in the absence of convertibility controls, choose to hold part of their foreign earnings in foreign assets and part in the form of pesos are forced to hold only peso assets. This forced conversion drives the supply of domestic money above the demand, thereby adversely affecting domestic inflation. It is possible, in this environment where export earnings must be converted into domestic currency, that an upward valuation of the currency can make the inflationary effect of the foreign reserve inflows worse by converting a given quantity of foreign exchange into a larger number of pesos!

Regarding the acquisition of foreign assets by domestic residents, a policy employed to some extent during the last boom was to lengthen the allowable period over which exporters could hold foreign exchange earnings before conversion into pesos. This reduces, at least temporarily, the monetary impact of the boom.

#### D. The Fiscal Policy Response

The government revenue and expenditure implications of commodity booms are also important. As was emphasized above, unless the government is able to generate a large fiscal surplus in boom periods, it may be extremely difficult for the monetary authority to sterilize the expansionary effect of foreign reserve inflows on the domestic money supply.

In the early 1970s, the central government had been running small fiscal deficits in the range of 2 percent of GDP. The beginning of the coffee boom (1976) produced a small fiscal surplus of 0.8 percent of GDP; government revenue grew by almost as much as the growth in nominal GDP (28.9 versus 31.4 percent), while expenditure was slow to adjust upward -- presumably due to lags in the budgetary process. This, however, was temporary. A period of rapid growth in government spending began in 1977 -- and, in fact, accelerated somewhat even after the boom peaked in 1978. As Table 6 shows, government expenditure grew at rates of 29.9, 35.8, 39.4, and 49.7 percent, respectively, during the 1977-80 period. These growth rates were well in excess of nominal GDP growth, causing the ratio of government expenditure to GDP to rise from 8.3 percent in 1976 to 10.8 percent in 1981. A large fraction of the increase in government spending was consumption expenditures, although public investment also increased sharply after 1979.

TABLE 6  
REVENUE AND EXPENDITURE OF CENTRAL GOVERNMENT  
MILLIONS OF PESOS

YEAR	REVENUE	EXPENDITURE	GOVERNMENT CONSUMPTION	SURPLUS	DOMESTIC NET BORROWING	FOREIGN NET BORROWING
1971	14388	16076	17100	-1688	461	1227
1972	16085	19759	18140	-3674	396	3278
1973	20361	23159	23010	-2798	-198	2996
1974	26247	29014	28210	-2767	2452	315
1975	38442	39351	36180	-909	1458	-549
1976	48832	44327	43680	4505	-3309	-1196
1977	63417	57597	55220	5820	-4189	-1631
1978	84065	78198	77826	5867	-3717	-2150
1979	114580	109032	110720	5548	-10762	5214
1980	151823	163217	159370	-11394	-5096	16490
1981	204956	214981	206870	-10025	-9519	19544
1982	257490	291147	272770	-33657	18796	14861
1983	290860	144667	351550	-53807	59955	-6148
1984	299814	429707	424000	-129893	128251	1642

SOURCE: REVISTA DEL BANCO DE LA REPUBLICA, AND IFS LINE 91F.  
NOTE: DOMESTIC NET BORROWING INCLUDES USE OF CASH BALANCES  
AND STATISTICAL DISCREPANCIES.

GDP PERCENTAGES

GROWTH RATE

YEAR	REVENUE	EXPENDITURE	GOVERNMENT CONSUMPTION	SURPLUS	DOMESTIC BORROWING	FOREIGN BORROWING	REVENUE	EXPENDITURE	GOVERNMENT CONSUMPTION	NOMINAL GDP
1971	9.2	10.3	11.0	-1.1	0.3	0.8	-	-	-	-
1972	8.5	10.4	9.6	-1.9	0.2	1.7	11.8	22.9	6.1	21.6
1973	8.4	9.5	9.5	-1.2	-0.1	1.2	26.6	17.2	26.8	28.2
1974	8.1	9.0	8.8	-0.9	0.8	0.1	28.9	25.3	22.6	32.6
1975	9.5	9.7	8.9	-0.2	0.4	-0.1	46.5	35.6	28.3	25.7
1976	9.2	8.3	8.2	0.8	-0.6	-0.2	27.0	12.6	20.7	31.4
1977	8.9	8.0	7.7	0.8	-0.6	-0.2	29.9	29.9	26.4	34.5
1978	9.2	8.6	8.6	0.6	-0.4	-0.2	32.6	35.8	40.9	27.0
1979	9.6	9.2	9.3	0.5	-0.9	0.4	36.3	39.4	42.3	30.7
1980	9.6	10.3	10.1	-0.7	-0.3	1.0	32.5	49.7	43.9	32.8
1981	10.3	10.8	10.4	-0.5	-0.5	1.0	35.0	31.7	29.8	25.6
1982	10.3	11.7	10.9	-1.3	0.8	0.6	25.6	35.4	31.9	26.0
1983	9.6	11.4	11.6	-1.8	2.0	-0.2	13.0	18.4	28.9	21.6
1984	8.1	11.6	11.5	-3.5	3.5	0	3.1	24.7	20.6	21.6

TABLE 7  
CONSOLIDATED PUBLIC SECTOR ACTIVITY

	1974	1975	1976	1977	1978	1979	1980	1981	1982
TOTAL REVENUE	80756	108724	155764	223129	322937	438434	623318	700487	908280
percent change	na	34.6	43.3	43.2	44.7	35.8	42.2	12.4	29.7
percent of GDP	25.0	26.8	29.3	31.2	35.5	36.9	39.5	35.3	36.6
CURRENT EXPENDITURE	51850	74546	99054	142375	212512	305024	446111	520915	663294
percent change	na	43.8	32.9	43.7	49.3	43.5	46.5	16.6	27.3
percent of GDP	16.1	18.4	18.6	19.9	23.4	25.7	28.3	26.3	26.
NET TRANSFERS OF PUBLIC SECTOR	11421	23377	19332	42704	60997	73451	95112	111416	152806
percent change	na	104.7	-17.3	120.9	42.8	20.4	29.5	17.1	37.1
percent of GDP	3.5	5.8	3.6	6.0	6.7	6.2	6.0	5.6	6.2
PUBLIC SECTOR SAVING	17485	10801	37378	38050	49428	59959	81400	68156	92180
percent change	na	-38.2	246.1	1.8	29.9	21.3	35.9	-16.4	35.2
percent of GDP	5.4	2.7	7.0	5.3	5.4	5.0	5.7	3.4	3.7
PUBLIC SECTOR FIXED INVESTMENT	20283	21410	30360	28405	37839	76212	108153	149639	185297
percent change	na	5.6	41.8	-6.4	33.2	101.4	41.9	38.4	23.8
percent of GDP	6.3	5.3	5.7	4.0	4.2	6.4	6.8	7.5	7.5
OVERALL BUDGET SURPLUS:	-2798	-10609	7018	9645	11589	-16253	-26655	-81483	-93117
percent change	na	279.2	-166.2	37.4	20.2	-240.2	64.0	205.7	14.3
percent of GDP	-0.9	-2.6	1.3	1.3	1.3	-1.4	-1.7	-4.1	-3.0

Source: Banco de la Republica (Sept. 1985 mission).



The government revenue effect of the boom was less pronounced. Revenues climbed from 8.1 percent of GDP in 1974 to 9.5 percent in 1975, reflecting a number of tax reforms initiated in 1974-5. After that, during the coffee boom, revenue growth was just slightly greater than the growth in GDP, as Table 6 shows. Nevertheless, the government failed to generate the additional revenue needed to pay for the aggressive expansion of expenditures. Consequently, the fiscal surplus at the beginning of the boom was rapidly eroded. Within three years, a deficit had reappeared; it grew steadily to 3.5 percent of GDP in 1984 as the divergence between the growth in revenue and expenditures continued.

Initially, the deficit was financed largely by external borrowing but after 1982, when the availability of foreign capital diminished, an increasing share of the fiscal deficit was financed by domestic borrowing -- either from the financial system or directly from the central bank.

Returning to the information on Colombia's inflation performance in Table 2, it is noteworthy that Colombian inflation exceeded international rates by considerably more than 10 percent per annum throughout the 1979-82 period. The fact that inflation continued to be high long after coffee prices peaked in 1977, while fiscal deficits soared, supports the hypothesis of Rajaram(1985) discussed in the main text. He maintains commodity price booms should not be blamed for the ongoing inflation that many primary product exporters experienced during the 1970s. Rather, the blame should fall on the run-away government spending and growing fiscal deficits that typically accompanied commodity booms. Rajaram's study focused on sub-Saharan Africa, but the same phenomenon occurred in Colombia.

#### Government Consumption

The pattern of government consumption during and after the 1976-80 coffee boom can be broken down into two phases. In the first two years of the boom (1976-77), Table 6 shows that government consumption grew at a slightly less rapid rate (in nominal terms) than GDP. In the next three years, however, it accelerated sharply -- growing at annual rates of 40.9, 42.3, and 43.9 percent. It slowed somewhat during the growth recession, but throughout the 1978-83 period, government consumption grew more rapidly than GDP. Between 1977 and 1983, government consumption/GDP rose from 7.7 to 11.6 percent.

The fact that government consumption expenditure accelerated in the 1976-80 boom and decelerated during the 1981-84 downturn suggests that it may have been exacerbating rather than smoothing the fluctuations in GDP caused by changes in the external market. This behavior is, of course, contrary to what is desirable from a macroeconomic stabilization point of view. The econometric analysis in Cuddington (1986), however, could not detect this strong procyclical response when examining the 1950-84 period as a whole. On the other hand, it did not uncover any tendency for government spending to be adjusted countercyclically either.

Data on the consolidated public sector, which are available on a consistent basis only for short time periods, yield similar conclusions

regarding the explosive growth of the deficit. According to Fund estimates, the overall public-sector deficit increased from roughly 2.5 percent of GDP in 1980 to almost seven percent in 1982, reflecting a considerable expansion in expenditure and a weakening of revenue growth. In early 1983, the Colombian authorities began to take measures to reduce the public-sector deficit, including a reform of the income tax and state and local taxes. While those measures resulted in a moderate increase in tax revenue relative to GDP, and non-tax revenue (especially that accruing to local governments) also increased, the public-sector deficit continued to rise, reaching 7.6 percent of GDP in 1983. The principal cause was the rapid growth in public expenditures which rose from 24 to 27 percent of GDP between 1982 and 1983, reflecting strong increases in current and capital expenditures. (IMF, May 1985 Staff Report, pp.3-4.)

In 1984, the public deficit remained unchanged at 7.6 percent of GDP, because of continued expenditure growth, even though revenues rose 19.7 percent to 20.9 percent of GDP. This revenue gain reflected the full-year impact of the 1983 tax reforms and a change in the application of the sales tax to a value added basis (IMF, op.cit., p5).

Table 7 shows an alternative consolidation of public-sector accounts provided by the Banco de la Republica in September 1985. Like the central government budget data, these data show the same inability of revenue growth to match the run-away increases in expenditure. According to the BR data, public-sector revenue rose from 26.8 percent of GDP in 1975 to a peak of 39.5 percent of GDP in 1980, before falling back somewhat as the economic slowdown began. From 1976 until 1981, however, the growth rate of current expenditure exceeded revenue growth. Consequently, public saving declined from 7.0 percent of GDP in 1976 to 3.4 percent in 1981.

In addition to the rapid expansion in current expenditures, capital investment also increased drastically, particularly after 1978. The ratio of public investment to GDP rose from 4.0 percent in 1977 to 7.5 percent in 1981 and 1982, reflecting major expansions in the electric and transportation sectors as well as joint venture investments in the oil and coal industries. Because the public saving rate was falling throughout the boom, the overall budget position of the consolidated public sector moved from a small surplus of 1.3 percent of GDP in the early years of the boom (1976-78) to a deficit of 4.1 percent of GDP as the public investment program expanded.

The fiscal impact of the boom can be summarized as follows. Public-sector revenue rose sharply as national income surged ahead during the boom, setting the stage for a rapid rise in government spending. In the 1977-80 boom, it was current expenditures that rose initially, followed a year or two later by increases in public investment expenditures.<sup>36/</sup> These

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<sup>36/</sup> Davis (1983, p.129) suggests that this was atypical among the countries that benefitted from the 1975-78 rise in beverage prices. In most of them, current expenditure growth was reasonably restrained while capital spending increased sharply.

investments were financed to a much greater extent than previously by public-sector borrowing abroad, as Table 7 shows.

It should be mentioned at this point that, in situations where country is experiencing a commodity export boom, major increases in the public expenditure program may have a destabilizing short-run effect -- regardless of whether or not they contribute to growth over the medium term. The problem is the procyclical nature of the government policy. If the public investment program could be postponed until the export boom wanes, on the other hand, it could potentially play an important stabilizing role.

Regarding the sectoral allocation of investment, the Colombian government's strategy of increasing investment in non-coffee export activities such as oil and coal production is most appropriate, provided the investments meet standard profitability criteria when the international interest rate is used as the opportunity cost of capital. This strategy continues and potentially accelerates export diversification, a long-standing goal of the Colombian economy.

APPENDIX C

DATA ON INDIVIDUAL COUNTRY EXPERIENCE WITH BOOMS

CHADIAN COFFEE BOOM: 1976-77

	Pre-Boom 72-75	Boom 76-77	Post-Boom 78-81
Price Coffee - percent change	13.0	78.9	-14.3
Price Petroleum - percent change	55.2	9.4	33.5
Real GDP Growth Rate	7.0	3.9	6.8
Real GDP Growth =	NA	NA	12.8
Nominal GDP Growth Rate	18.0	18.7	22.8
Inflation Rate	9.8	12.5	15.8
Money Growth Rate	15.4	28.1	19.7
Reserve Money Growth Rate	11.9	25.8	21.2
Foreign Reserves Growth Rate	-9.3	24.4	38.8
Nominal Export Growth Rate	17.7	19.0	18.8
Nominal Import Growth Rate	16.5	17.7	20.2
Govt Revenue/GDP	NA	18.8	18.1
Govt Expenditures/GDP	NA	18.8	17.8

CHADIAN PETROLEUM BOOM: 1979-80

	Pre-Boom 75-78	Boom 79-80	Post-Boom 81-83
Price Coffee - percent change	33.1	-0.9	-4.3
Price Petroleum - percent change	0.4	62.0	-4.3
Real GDP Growth Rate	4.6	5.7	5.7
Real GDP Growth =	2.8	14.9	7.3
Nominal GDP Growth Rate	18.5	18.4	24.8
Inflation Rate	13.3	11.9	17.8
Money Growth Rate	14.7	19.2	22.0
Reserve Money Growth Rate	17.7	18.8	23.0
Foreign Reserves Growth Rate	2.2	95.3	20.2
Nominal Export Growth Rate	18.7	24.9	13.5
Nominal Import Growth Rate	24.1	22.8	14.2
Govt Revenue/GDP	18.4	18.3	19.6
Govt Expenditures/GDP	17.8	16.5	20.7

**COLUMBIA OFFICE BOOK: 1976-1977**

	Pre-Boom 72-75	Boom 76-77	Post-Boom 78-81
Price Coffer- percent change	13.0	78.9	-14.3
Real GDP Growth Rate	5.6	4.4	5.1
Monreal GDP Growth Rate	27.0	33.0	29.8
Inflation Rate	20.4	27.2	22.8
Money Growth Rate	23.9	32.6	25.5
Reserve Money Growth Rate	25.3	40.8	34.2
Foreign Reserves Growth Rate	31.3	95.3	30.4
Monreal Export Growth Rate	36.3	37.3	19.5
Monreal Import Growth Rate	25.1	29.0	34.6
Govt Revenue & Grants/GDP	11.1	11.8	11.8
Govt Expend. & Net Lending/GDP	12.6	11.0	13.1

## DOMINICAN REPUBLIC SUGAR BOON: 1974

	Pre-Boon 70-72	Boon 74	Post-Boon 75-76
Price Sugar- percent change	32.2	211.4	-27.1
Real GDP Growth Rate	8.8	6.8	4.8
Nominal GDP Growth Rate	14.0	25.8	13.8
Inflation Rate	3.7	18.8	7.8
Money Growth Rate	14.3	48.8	8.1
Reserve Money Growth Rate	12.4	48.5	7.3
Foreign Reserves Growth Rate	21.8	3.3	17.8
Nominal Export Growth Rate	25.3	44.8	4.8
Nominal Import Growth Rate	14.3	82.4	6.8
Govt Revenue/GDP	17.1	17.5	18.1
Govt Expenditures/GDP	17.7	18.7	18.8

## DOMINICAN REPUBLIC SUGAR BOON: 1979-1980

	Pre-Boon 75-78	Boon 79-80	Post-Boon 81-83
Price Sugar- percent change	-27.1	118.2	-38.2
Real GDP Growth Rate	4.8	5.3	3.2
Nominal GDP Growth Rate	13.8	18.4	8.8
Inflation Rate	7.8	12.4	5.8
Money Growth Rate	6.1	13.8	18.5
Reserve Money Growth Rate	7.3	2.4	14.8
Foreign Reserves Growth Rate	17.8	18.8	8.8
Nominal Export Growth Rate	4.8	18.7	-3.2
Nominal Import Growth Rate	6.8	28.8	-8.8
Govt Revenue/GDP	18.1	13.8	11.8
Govt Expenditures/GDP	18.8	17.3	14.8

## DOMINICAN REPUBLIC SUGAR BOON: 1983

	Pre-Boon 81-82	Boon 83	Post-Boon 84-87
Price Sugar- percent change	-2.5	186.8	-24.8
Real GDP Growth Rate	7.4	7.5	2.4
Nominal GDP Growth Rate	18.8	14.7	3.3
Inflation Rate	2.7	8.8	8.7
Money Growth Rate	5.8	14.2	-1.3
Reserve Money Growth Rate	3.2	21.8	3.5
Foreign Reserves Growth Rate	58.8	132.8	-4.8
Nominal Export Growth Rate	-8.1	1.8	-1.8
Nominal Import Growth Rate	35.5	22.8	5.8
Govt Revenue/GDP	17.5	17.1	14.8
Govt Expenditures/GDP	28.5	18.8	17.7

## DOMINICAN REPUBLIC SUGAR BOON: 1988

	Pre-Boon 85-88	Boon 89	Post-Boon 90-91
Price Sugar- percent change	-1.7	70.3	15.8
Real GDP Growth Rate	5.7	12.2	8.7
Nominal GDP Growth Rate	8.5	17.8	11.3
Inflation Rate	8.8	4.1	1.5
Money Growth Rate	1.8	7.3	12.3
Reserve Money Growth Rate	3.3	17.1	14.3
Foreign Reserves Growth Rate	-18.8	12.8	38.3
Nominal Export Growth Rate	13.4	8.8	18.4
Nominal Import Growth Rate	17.8	11.8	17.8
Govt Revenue/GDP	25.7	16.8	18.5
Govt Expenditures/GDP	17.8	17.2	17.5

**GHANA COCOA BOOMS: 73-74 & 76-77**

	Pre-Boom 69-72	Boom 73-74	Downturn 75	Boom 76-77	Downturn 78-81
Price Cocoa- percent change	-8.1	78.5	-28.0	78.8	-18.8
Real GDP Growth Rate	3.9	9.3	-12.9	-8.8	8.9
Nominal GDP Growth Rate	13.5	28.7	13.4	47.3	88.9
Inflation Rate	9.3	18.0	38.6	47.8	58.0
Money Growth Rate	16.7	22.8	44.8	54.6	42.6
Reserve Money Growth Rate	21.3	38.8	47.9	51.7	47.2
Foreign Reserves Growth Rate	21.7	14.3	74.4	17.8	8.5
Nominal Export Growth Rate	14.7	22.1	10.6	12.5	28.9
Nominal Import Growth Rate	8.8	57.9	-7.6	15.3	33.3
Govt Revenue/GDP	17.2	11.8	15.3	11.8	8.8
Govt Expenditures/GDP	20.2	15.9	21.7	28.9	13.0



# INDONESIA PETROLEUM BOOM: 1973-74

	Pre-Boom 68-72	Boom 73-74	Post-Boom 75-78
Price Petroleum- percent change	7.3	125.4	0.4
Real GDP Growth Rate	7.5	9.5	7.1
Nominal GDP Growth Rate	21.7	53.3	28.7
Inflation Rate	13.3	40.1	12.7
Money Growth Rate	42.6	41.0	27.5
Reserve Money Growth Rate	41.8	40.1	22.3
Foreign Reserves Growth Rate	75.7	82.9	41.8
Nominal Export Growth Rate	37.1	104.5	13.2
Nominal Import Growth Rate	27.8	83.4	11.0
Govt Revenue/GDP	11.6	15.7	18.8
Govt Expenditures/GDP	14.3	17.2	19.9

# INDONESIA PETROLEUM BOOM: 1979-80

	Pre-Boom 75-78	Boom 79-80	Post-Boom 81-83
Price Petroleum- percent change	0.4	62.0	-4.3
Real GDP Growth Rate	7.1	8.1	4.8
Nominal GDP Growth Rate	20.7	41.4	17.8
Inflation Rate	12.7	30.9	12.3
Money Growth Rate	27.5	42.2	15.2
Reserve Money Growth Rate	22.3	33.8	15.3
Foreign Reserves Growth Rate	41.8	43.7	-8.7
Nominal Export Growth Rate	13.2	69.5	15.2
Nominal Import Growth Rate	11.0	78.8	29.2
Govt Revenue/GDP	18.8	22.4	22.1
Govt Expenditures/GDP	19.9	23.9	23.8

# **JAMAICA BALKITE BOOM: 1974-75**

	Pre-Boom 70-73	Boom 74-75	Post-Boom 76-78
Baunkite Price - Exchange	9.6	32.5	9.7
Real GDP Growth Rate	6.4	-2.5	-2.8
Nominal GDP Growth Rate	14.8	23.0	13.3
Inflation Rate	8.1	28.1	16.3
Money Growth Rate	18.7	21.8	21.8
Reserve Money Growth Rate	14.2	18.6	9.7
Foreign Reserves Growth Rate	45.5	54.1	50.5
Net Exports/GDP	-7.3	-10.3	-3.0
Govt Revenue/GDP	18.5	22.8	23.5
Govt Expenditures/GDP	22.5	30.3	37.7
Government Deficit/GDP	-4.0	-7.8	-15.8

# **JAMAICA BALKITE BOOM: 1979-88**

	Pre-Boom 76-78	Boom 79-88	Post-Boom 81-84
Baunkite Price - Exchange	9.7	24.7	-8.0
Real GDP Growth Rate	-2.8	-3.8	1.3
Nominal GDP Growth Rate	13.3	12.7	19.0
Inflation Rate	16.3	17.2	17.6
Money Growth Rate	21.8	12.1	18.7
Reserve Money Growth Rate	9.7	22.4	30.7
Foreign Reserves Growth Rate	50.5	27.6	8.2
Net Exports/GDP	-3.0	-1.8	-10.2
Govt Revenue/GDP	23.5	28.1	27.5
Govt Expenditures/GDP	37.7	43.0	42.0
Government Deficit/GDP	-15.8	-18.0	-14.8

INDEX RETURN LINE: 1973-74

	Pre-66	66-72	Post-66
Price Return- percent change	7.3	15.4	0.4
Real GDP Growth Rate	6.5	7.3	5.4
National GDP Growth Rate	13.6	26.3	27.0
Inflation Rate	6.7	18.0	20.6
Money Growth Rate	12.0	21.5	20.0
Reserve Money Growth Rate	26.3	35.3	45.4
Foreign Reserves Growth Rate	10.4	12.0	12.0
National Export Growth Rate	12.2	20.0	30.5
National Import Growth Rate	10.1	30.4	20.0
Govt Revenue/GDP	9.0	10.3	12.0
Govt Expenditure/GDP	11.0	14.2	16.7

INDEX RETURN LINE: 1975-80

	Pre-66	66-75	Post-66
Price Return- percent change	0.4	12.0	-4.3
Real GDP Growth Rate	5.4	0.7	0.7
National GDP Growth Rate	27.0	35.3	30.0
Inflation Rate	20.0	24.5	00.2
Money Growth Rate	20.0	32.0	45.3
Reserve Money Growth Rate	45.4	77.7	00.2
Foreign Reserves Growth Rate	12.0	27.7	100.1
National Export Growth Rate	14.5	00.4	00.3
National Import Growth Rate	20.0	00.7	41.2
Govt Revenue/GDP	12.0	15.0	16.7
Govt Expenditure/GDP	16.7	10.3	20.7

# **NIIGERIA PETROLEUM BOOM: 1973-74**

	Pre-Boom 69-72	Boom 73-74	Post-Boom 75-78
Price Petroleum- percent change	7.3	115.4	6.4
Real GDP Growth Rate	20.6	4.7	1.8
Nominal GDP Growth Rate	28.6	58.9	17.4
Inflation Rate	6.4	48.7	15.5
Money Growth Rate	22.9	58.8	33.8
Reserve Money Growth Rate	21.6	87.4	25.6
Foreign Reserves Growth Rate	46.1	479.9	-28.3
Nominal Export Growth Rate	35.5	187.6	4.6
Nominal Import Growth Rate	24.3	48.8	38.1
Govt Revenue/GDP	10.4	19.2	19.2
Govt Expenditures/GDP	11.9	12.6	12.7

# **NIIGERIA PETROLEUM BOOM: 1979-80**

	Pre-Boom 75-78	Boom 79-80	Post-Boom 81-83
Price Petroleum- percent change	8.4	62.8	-4.3
Real GDP Growth Rate	1.8	3.4	-3.8
Nominal GDP Growth Rate	17.4	18.3	3.6
Inflation Rate	15.5	14.4	7.7
Money Growth Rate	33.8	35.3	7.8
Reserve Money Growth Rate	25.6	42.5	2.8
Foreign Reserves Growth Rate	-28.3	138.3	-53.1
Nominal Export Growth Rate	4.6	41.8	-17.5
Nominal Import Growth Rate	38.1	11.7	-6.3
Govt Revenue/GDP	19.2	21.7	—
Govt Expenditures/GDP	12.7	8.7	—

PAPUA NEW GUINEA COPPER BOOM: 1973-74

	Pre-Boom 69-72	Boom 73-74	Post-Boom 75-76
Price Copper- percent change	5.6	23.25	-3.41
Real GDP Growth Rate	6.1	12.00	2.00
Nominal GDP Growth Rate	11.9	27.00	6.33
Inflation Rate	5.5	12.00	6.51
Money Growth Rate	—	—	7.42
Reserve Money Growth Rate	—	—	27.23
Foreign Reserves Growth Rate	—	—	130.42
Nominal Export Growth Rate	20.2	83.71	4.01
Nominal Import Growth Rate	24.7	-6.52	10.10
Govt Revenue/GDP	—	—	10.52
Govt Expenditures/GDP	—	—	33.30

PAPUA NEW GUINEA COPPER BOOM: 1979-80

	Pre-Boom 75-78	Boom 79-80	Post-Boom 81-84
Price Copper- percent change	-3.4	25.4	-9.4
Real GDP Growth Rate	2.0	-1.1	0.0
Nominal GDP Growth Rate	0.3	10.1	6.3
Inflation Rate	6.5	11.2	5.3
Money Growth Rate	7.0	6.2	5.9
Reserve Money Growth Rate	27.2	-10.2	9.1
Foreign Reserves Growth Rate	130.6	4.3	1.0
Nominal Export Growth Rate	4.0	13.0	5.0
Nominal Import Growth Rate	10.2	20.5	7.2
Govt Revenue/GDP	10.5	20.2	21.7
Govt Expenditures/GDP	33.4	32.0	36.0

**ZAMBIA CUPPER BOOMS: 1973-74 and 1979-80**

	Pre-Boom 69-72	Boom 73-74	Downturn 75-78	Boom Post-Boom 79-80	81-84
Copper Price-£ change	5.8	23.3	-3.4	25.4	-4.4
Real GDP Growth Rate	3.7	2.9	-0.5	-0.8	8.8
Inflation Rate	3.3	15.2	5.7	16.8	12.9
Money Growth Rate	5.3	15.8	11.2	15.3	13.8
Reserve Money Growth Rate	12.8	11.8	18.3	8.3	15.9
Foreign Reserves Growth Rate	9.8	2.8	-24.8	27.2	-7.8
Mineral Export Growth Rate	7.8	27.1	-8.8	32.5	12.3
Mineral Import Growth Rate	5.8	19.2	2.9	38.1	4.4
Govt Revenue/GDP	28.8	31.9	25.5	23.7	23.2
Govt Expenditure/GDP	31.7	28.8	38.1	33.7	38.8

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